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CITY OF VISALIA

NOISE ELEMENT TO THE GENERAL PLAN

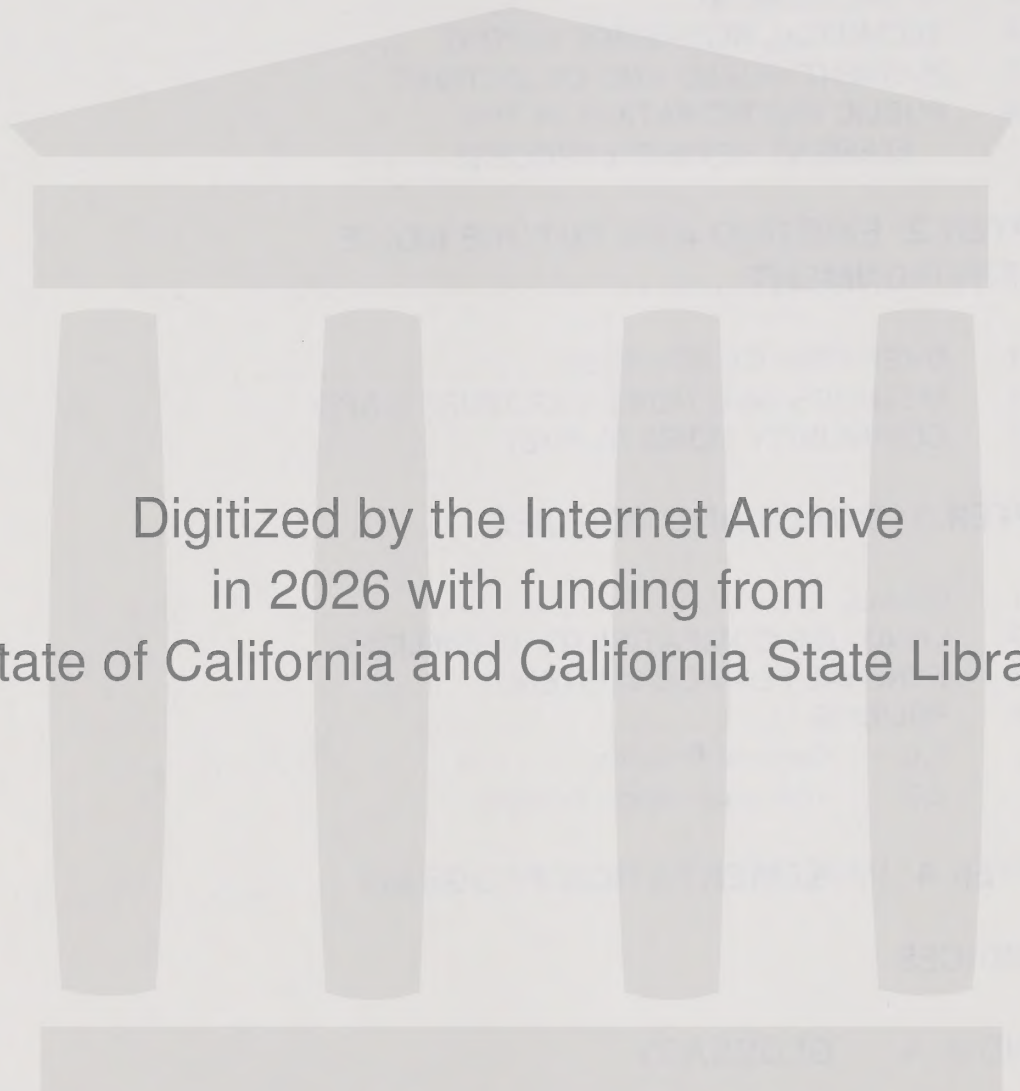
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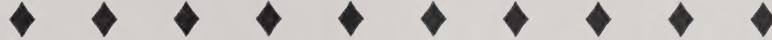


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CHAPTER 1

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1 OVERVIEW

1.2 THE GENERAL PLAN

The General Plan is the primary community planning tool which balances all aspects of growth and development. It is a long-term, comprehensive framework for the physical, social and economic issues in a community's planning area. Visalia's General Plan is a long-range guide for attaining the City's ultimate service area and accommodating its population to the year 2020. The plan is a comprehensive document which coordinates all components of the City's physical development.

State law requires all cities and counties to adopt and maintain a General Plan. It must include seven elements (Land Use, Circulation, Housing, Conservation, Open Space, Noise and Safety). These mandatory elements may be supplemented by optional elements at the discretion of the local jurisdiction. The Visalia General Plan includes the following optional elements: Urban Boundaries, Seismic Safety, Historic Preservation and Scenic Highways. These General Plan Elements must be consistent. No conflicts (text or map) are allowed among the Plan's elements.

Amending the General Plan is accomplished by short-term (yearly adjustments) and longer-term (major revisions or updates). Government Code Sections 65350 et seq. outlines the procedures to amend the General Plan, and the plan may be amended only "in the public interest." Therefore, a General Plan should be amended only with broad support and when such a change is necessary to accommodate changing community conditions or attitudes.

Each mandatory General Plan element (text and maps) may be amended as many as four times per year. This requirement does not apply to optional General Plan amendments. State law does not establish a schedule for major revisions or updates (except every five years for the Housing Element). However, periodic review should occur every five years.

1.3 NOISE ELEMENT

Requirements for the Noise Element are detailed in Government Code Section 65302(f). These requirements indicate that a Noise Element, at a minimum, is to identify and appraise noise problems in the community according to the guidelines adopted by the Office of Noise Control - State Department of Health Services (ONC).

Chapter 1: Introduction

According to the Government Code requirements for Noise Elements and the ONC Guidelines, noise exposure information should be developed as part of the Noise Element for the following major noise sources:

1. Highways and freeways
2. Primary arterials and major local streets
3. Railroad operations
4. Aircraft and airport operations
5. Local industrial facilities
6. Other stationary sources.

Noise-sensitive areas to be considered during the development of noise exposure information should include areas containing the following noise sensitive land uses:

1. Residential development
2. Schools
3. Hospitals, rest homes and long-term medical or mental care facilities
4. Churches
5. Other uses deemed noise sensitive by the local jurisdiction.

The ONC Guidelines require that certain major noise sources and areas containing noise sensitive land uses be identified and quantified by preparing generalized noise exposure contours for current and projected conditions within the community. Contours may be prepared in terms of either the **Community Noise Equivalent Level (CNEL)** or the **Day-Night Average Level (L_{dn})**, which are descriptors of total noise exposure at a given location for an annual average day. CNEL and L_{dn} are generally considered to be equivalent descriptors of the community noise environment within plus or minus 1.0 dB. Appendix A provides an explanation of the acoustical terminology used in this document.

The Noise Element is most directly related to the Land Use & Circulation Elements of the General Plan. Its relationship to the Land Use Element is direct, since the implementation of either element has the potential to result in the creation or elimination of noise conflicts between land uses. The Land Use Element and the Noise Element should be consistent in order to discourage the development of incompatible adjacent land uses, thereby preventing impacts upon noise sensitive uses and encroachment upon existing noise generating facilities.

Chapter 1: Introduction

The Circulation Element is linked to the Noise Element since traffic routing and volumes directly affect and are the primary cause of community noise exposure. For example, increased traffic volume may produce increased noise in a residential area so that noise control measures are required to provide an acceptable noise environment. Similarly, simple site design techniques may provide significant noise relief to an area.

It is intended that the noise exposure information developed during the preparation of the Noise Element be utilized by Visalia to implement the requirements of California Administrative Code (CAC) Title 24 by providing a basis for determining where noise-related land use conflicts presently exist or may occur in the future. It is also intended that the noise exposure information developed for the Noise Element be used to provide baseline levels for use in the review of development projects and enforcement of the local noise control ordinance. The noise ordinance has already been adopted to address noise levels generated by local industrial, commercial, agricultural and residential uses, which are not otherwise regulated by federal or state noise level standards. City regulation of noise sources such as traffic on public roadways, railroad operations and aircraft operations is pre-empted by existing federal and/or state regulations, meaning that such sources generally may not be addressed by the noise ordinance. Such factors are, however, to be considered when making land use decisions and recommendations.

1.4 TECHNICAL REFERENCE REPORT

A separate Technical Reference Report has been prepared in support of this Noise Element which provides discussions of the fundamentals of noise assessment, the effects of noise on people, criteria for acceptable noise exposure and the techniques available for noise control. It is intended that the Technical Reference Report serve as a reference for Visalia during the review of documents or proposals which refer to the measurement of effects of noise.

1.5 ELEMENT GOALS AND OBJECTIVES

Goal, Objective, Policy, Program and Standard statements used in this Element are defined below:

Goal: A future end or condition related to public health, safety or general welfare toward which Visalia will direct planning and implementation.

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Objective: A specific end or condition which is an intermediate step to attain a goal. There may be several objectives to attain a goal.

Policy: A specific statement that guides decision-making. The word 'shall' makes a policy statement mandatory. A policy is implemented by specific action programs.

Program: An action or strategy carried out to meet policies and achieve objectives.

Standard: A rule establishing a level of quality or quantity that must be complied with or satisfied.

This element of the Visalia General Plan has three goal statements and a series of complementing policies and programs. The Element's goals are listed below:

1. Protect citizens from the harmful effects of exposure to excessive noise.
2. Protect the City's economic base by preventing the encroachment of incompatible land uses near known noise producing industries, railroads, airports, and other sources.
3. Protect existing and future noise-sensitive land uses from encroachment of and exposure to excessive levels of noise.

1.6 PUBLIC PARTICIPATION IN THE ELEMENT REVISION PROCESS

Prior to development of the Draft Noise Element, the following public meetings and workshops were conducted:

1. Planning Commission Study Session in 1988 and 1989.

Adoption of the Final Noise Element will involve the following actions:

1. Circulation of a Negative Declaration.
2. Planning Commission Study Session.

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3. Planning Commission Public Hearing and recommendation for approval for the Noise Element and environmental document.
4. City Council Work Session.
5. City Council Public Hearing and adoption of the environmental document and the Noise Element.

CHAPTER 2

EXISTING AND FUTURE NOISE ENVIRONMENT

CHAPTER 2: EXISTING AND FUTURE NOISE ENVIRONMENT

2.1 OVERVIEW OF SOURCES

There are a number of potentially significant sources of community noise within the City of Visalia. These sources include traffic on State highways and major City and County roadways, railroad operations, airport operations, and industrial, commercial and agricultural activities. Figure 1 shows the locations of major city noise sources for which generalized L_{dn} or CNEL contours have been prepared.

2.2 METHODS AND NOISE EXPOSURE MAPS

Analytical noise modeling techniques were used in conjunction with actual field noise level measurements to develop generalized L_{dn} or CNEL contours for future (2020) traffic projection conditions contained in the Draft 1995 Circulation Element update, and for fixed-point sources. The analytical noise modeling techniques generally make use of noise source-specific data, including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. These methods have been developed for many environmental noise sources, including roadways, railroad line operations, railroad yard operations, industrial plants and aircraft/airport operations. Such methods will produce reliable results as long as data inputs and assumptions are valid for the sources being studied. The methods used in the development of this Element closely follow recommendations made by the State Office of Noise Control, and included in FHWA Highway Traffic Noise Prediction Model for roadway sources, the Wyle Laboratories method for determining railroad noise exposure and the FAA's Integrated Noise Model (INM) for the assessment of aircraft/airport noise sources.

For industrial, commercial and other stationary sources identified for study, a combination of source-specific noise level data and accepted calculation procedures was used to characterize noise emissions, based upon operational data obtained from source operators. The noise exposure information developed during the preparation of the Noise Element does not include all conceivable sources of industrial, commercial or agricultural noise within the County, but rather is a representative sampling of typical sources. The noise exposure information developed for the sources identified for study should be used only as an indicator of potential noise impacts when other, similar sources are considered.

Noise exposure contours for fixed point and onsite sources of noise within Visalia are illustrated in Appendix B. It should be noted that these contours are generally based upon annual average conditions (unless otherwise noted), and are intended to be representative of "typical" conditions for the types of noise sources being characterized. This noise exposure information should be used by the City during the project review and long-range planning processes to identify areas which are potentially noise-impacted. It should be noted that site-specific studies would generally indicate that the noise exposure information presented in Appendix B represents a conservative (worst-case) assessment of noise exposure, and that local topographical features, natural or man-made barriers or intervening buildings may significantly affect noise exposure at a given receiver location. Further, the fixed point source noise inventory was conducted in 1986. Since that time, improvements have been made to the various facilities that were inventoried, including a reduction of railroad operations and modification of noise emission at the major manufacturing plants. For this reason, the inventory should be considered a "worst case" scenario.

2.3 COMMUNITY NOISE SURVEY

As required by the Government Code and ONC Guidelines, a community noise survey was conducted to document noise exposure in areas of the City containing noise sensitive land uses. Noise monitoring sites were selected to be representative of typical conditions in areas where noise sensitive land uses are located. A total of eight monitoring sites were selected, as listed in Table 1. A combination of short-term and continuous noise monitoring was used to document existing noise levels at these locations during the month of November, 1986. Noise levels were sampled for approximately fifteen minutes during each of three periods of the day and night so that reliable estimates of L_{dn} could be prepared. The data collected during the short-term sampling program included the L_{eq} , maximum noise level, minimum noise level and a description of noise sources which were audible at the monitoring sites. Continuous noise monitoring was conducted to document fluctuations in noise levels over a typical 24-hour period in areas which are representative of the different types of noise environments within the City. Noise level data collected during continuous monitoring include the L_{eq} , maximum noise level, and the statistical distribution of noise levels for each hour of the sample period. The hourly fluctuations of noise levels at the sites where continuous noise monitoring was conducted and depicted in graphic form in the Technical Reference Report.

The noise survey results indicate that noise levels, measured at property lines, in areas containing noise sensitive land uses in the City range from 45 to 55 dB L_{dn} . As would be expected, the quietest areas were those which are removed from major

Chapter 2: Existing and Future Noise Environment

transportation related noise sources and local industrial or other major stationary noise sources. It is anticipated that noise levels in recreational areas would be somewhat higher than measured during the survey during the summer season, when such areas receive greater use. The noisier locations monitored during the survey were in areas located near State highways and major City streets, or major industrial noise sources. Maximum noise levels observed during the survey were generally caused by local automobile traffic or heavy trucks. Other sources of maximum noise levels included occasional aircraft overflights, railroad operations, barking dogs, and nearby industrial, commercial, and agricultural equipment and machinery. Background noise levels in the absence of the above described sources were caused by distant traffic, wind in the trees, running water, birds and distant agricultural, industrial or other stationary noise sources.

Table 2 shows a quantitative estimate and illustration of the noise contours associated with the traffic projections contained in the Circulation Element. These estimates indicate that the primary impacts will occur along arterials and heavily travelled collector roadways.

TABLE 1
SUMMARY OF NOISE SURVEY DATA

Site and Location		LD	LN	Lmax	(Source)	Lmin	(Source)	Ldn *
1	North Visalia Community Center	54	45	65	(traffic)	41	(traffic)	54dB
2	Golden West High School	51	36	60	(aircraft)	35	(traffic)	50dB
3	Recreation Park	55	41	61	(truck)	39	(auto)	55dB
4	College of Sequoias	47	40	64	(traffic)	28	(traffic)	48dB
5	Jefferson Park	52	40	62	(traffic)	38	(traffic)	51dB
6	Willow Glen School	57	41	69	(truck)	37	(traffic)	56dB
7	Crestwood School	46	34	53	(traffic)	33	(industry)	45dB
8	Victor Street and Jackie Street	49	40	67	(traffic)	37	(traffic)	49dB

L_D = Average L_{eq} of two 15-minute samples obtained between 7:00 a.m. and 10:00 p.m. except for sites marked with ** where 24-hour monitoring was conducted.

L_N = L_{eq} for one 15-minute sample obtained between 10:00 p.m. and 7:00 a.m. except for sites marked with ** where 24-hour monitoring was conducted.

Measured at property line

* = L_{dn} estimated from L_D and L_N

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
AVENUE 320					
Plaza to Shirk	6,400	60	10	25	50
Shirk to Akers	9,600	62	15	30	70
Akers to Demaree	11,800	63	15	35	80
Demaree to Mooney	9,800	62	15	30	70
Mooney to Dinuba	11,800	63	15	35	80
Dinuba to Ben Maddox	8,300	61	15	25	60
Ben Maddox to McAuliff	4,900	58	10	15	35
McAuliff to Rd. 156	2,800	55	5	10	25
AVENUE 316					
Shirk to Akers	3,200	56	5	15	25
Akers to Chinowth	6,700	60	10	25	50
Chinowth to Demaree	6,200	59	10	20	45
Demaree to Mooney	4,800	58	10	15	35
Mooney to Giddings	5,200	59	10	20	45
Giddings to Dinuba	7,300	60	10	25	50
RIGGIN					
(Betty) 99 to Plaza	32,300	68	35	80	170
Plaza to Rd 88	37,000	69	45	90	200
Rd 88 to Akers	47,500	71	60	125	270
Akers to Demaree	47,800	71	60	125	270
Demaree to Mooney	57,300	72	70	145	315
Mooney to Dinuba	58,500	72	70	145	315
Dinuba to Court	34,400	69	45	90	200
Court to Ben Maddox	24,400	67	30	70	145
Ben Maddox to Lovers Lane	10,200	62	15	30	70
Lovers Lane to McAuliff	6,300	60	10	25	50
McAuliff to Road 148	4,000	57	5	15	30
FERGUSON					
Shirk to Akers	14,100	64	20	45	90
Akers to Demaree	7,500	60	10	25	50
Demaree to Mooney	8,900	61	15	25	60
Mooney to Dinuba	9,500	62	15	30	70
Dinuba to Santa Fe	10,600	62	15	30	70

*ROUNDED TO NEAREST FIVE FEET

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
<u>DOE</u>					
Demaree to Mooney	28,000	68	35	80	170
Mooney to Dinuba	25,800	67	30	70	145
Dinuba to Court	21,900	66	25	60	125
Court too Santa Fe	17,500	65	25	50	110
Santa Fe to Ben Maddox	29,900	68	35	80	170
Ben Maddox to Lovers Lane	21,500	66	25	60	125
Lovers Lane to McAuliff	18,500	65	25	50	110
McAuliff to Road 152	13,300	64	20	45	90
<u>GOSHEN</u>					
Hwy 99 to Road 78	27,000	67	30	70	145
Road 78 to Road 80	50,800	71	60	125	270
Road 80 to Shirk	40,100	70	50	110	230
Shirk to Akers	41,500	70	50	110	230
Akers to Chinowth	47,700	71	60	125	270
Chinowth to Demaree	31,600	68	35	80	170
Demaree to Giddings	35,400	69	45	90	200
Giddings to Dinuba	13,300	64	20	45	90
Dinuba to Court	23,600	67	30	70	145
Court to Santa Fe	9,900	62	15	30	70
Santa Fe to Ben Maddox	6,400	60	10	25	50
Ben Maddox to Lovers Lane	7,300	60	10	25	50
<u>HURLEY</u>					
Plaza to Road 88	7,500	60	10	25	50
Road 88 to Shirk	9,300	62	15	30	70
Shirk to Akers	15,900	65	25	50	110
Akers to Chinowth	13,100	64	20	45	90
<u>HWY 198</u>					
Shirk to Akers	92,000	74	90	200	430
Akers to Chinowth	6,700	60	10	25	50
Chinowth to Demaree	9,300	62	15	30	70
Demaree to Mooney	10,400	62	15	30	70
Mooney to court	80,200	73	80	170	370
Court to Ben Maddox	80,200	73	80	170	370

*ROUNDED TO NEAREST FIVE FEET

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
Ben Maddox to Lovers Lane	83,200	74	90	200	430
Lovers Lane to Road 148	69,400	73	80	170	370
Road 148 to Road 152	51,400	71	60	125	270
<u>TULARE AVENUE</u>					
Akers to Demaree	21,000	66	25	60	125
Demaree to Mooney	29,300	68	35	80	170
Mooney to Court	30,100	68	35	80	170
Court to Ben Maddox	19,900	66	25	60	125
Ben Maddox to Pinkham	16,200	65	25	50	110
Pinkham to Lovers Lane	8,600	61	15	25	60
Lovers Lane to McAuliff	6,800	60	10	25	50
McAuliff to Road 148	3,200	56	5	15	25
<u>WALNUT</u>					
Plaza to Shirk	24,600	67	30	70	145
Shirk to Akers	29,800	68	35	80	170
Akers to Demaree	28,200	68	35	80	170
Demaree to Mooney	28,300	68	35	80	170
Mooney to Giddings	33,100	69	45	90	200
Giddings to Court	33,500	69	45	90	200
Court to Ben Maddox	31,600	68	35	80	170
Ben Maddox to Lovers Lane	28,000	68	35	80	170
Lovers Lane to Road 148	24,000	67	30	70	145
<u>WHITENDALE</u>					
Akers to Demaree	19,800	66	25	60	125
Demaree to County Center	22,900	67	30	70	145
County Center to Mooney	32,200	68	35	80	170
Mooney to Giddings	26,400	67	30	70	145
Giddings to Court	12,800	63	15	35	80
<u>K ROAD</u>					
Santa Fe to Ben Maddox	17,100	65	25	50	110
Ben Maddox to Lovers Lane	15,000	64	20	45	90
Lovers Lane to McAuliff	10,400	62	15	30	70
McAuliff to Road 148	4,400	58	10	15	35

*ROUNDED TO NEAREST FIVE FEET

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
<u>CALDWELL</u>					
Shirk to Akers	23,200	67	30	70	145
Akers to Demaree	3,300	56	5	15	25
Demaree to County Center	41,800	70	50	110	230
County Center to Mooney	62,400	72	70	145	315
Mooney to Court	66,600	72	70	145	315
Court to Ben Maddox	54,000	71	60	125	270
Ben Maddox to Lovers Lane	43,000	70	50	110	230
Lovers Lane to McAuliff	26,900	67	30	70	145
McAuliff to Road 156	34,000	69	45	90	200
<u>AVENUE 276</u>					
Shirk to Akers	19,600	66	25	60	125
Akers to Demaree	29,200	68	35	80	170
Demaree to Mooney	40,200	70	50	110	230
Mooney to Court	54,200	71	60	125	270
Court to Ben Maddox	45,200	70	50	110	230
Ben Maddox to Lovers Lane	46,400	70	50	110	230
Lovers Lane to McAuliff	28,600	68	35	80	170
McAuliff to Road 148	19,600	66	25	60	125
<u>AVENUE 272</u>					
Shirk to Akers	1,500	52	5	5	15
Akers to Demaree	6,200	59	10	20	45
Demaree to Mooney	13,300	64	20	45	90
Mooney to Court	24,100	67	30	70	145
Court to Ben Maddox	18,900	66	25	60	125
Ben Maddox to Lovers Lane	16,000	65	25	50	110
Lovers Lane to McAuliff	9,100	62	15	30	70
McAuliff to Road 148	3,400	56	5	15	25
<u>HWY 99</u>					
Avenue 320 to Midvalley	163,800	77	145	315	680
<u>PLAZA</u>					
Walnut to SR 198	20,000	66	25	60	125
SR 198 to Hurley	65,900	72	70	145	315
Hurley too Goshen	59,200	72	70	145	315

*ROUNDED TO NEAREST FIVE FEET

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
Goshen to Avenue 308	46,800	70	50	110	230
Avenue 308 to Riggins	34,300	69	45	90	200
Riggins to Avenue 320	24,200	67	30	70	145
Avenue 320 to Avenue 328	32,900	69	45	90	200
<u>SHIRK</u>					
Avenue 272 to Caldwell	11,400	63	15	35	80
Caldwell to Walnut	29,400	68	35	80	170
Walnut to Tulare	24,200	67	30	70	145
Tulare to SR 198	33,100	69	45	90	200
SR 198 to Goshen	42,500	70	50	110	230
Goshen to Riggins	43,900	70	50	110	230
Riggins to Avenue 316	8,500	61	15	25	60
Avenue 316 to Avenue 320	5,700	59	10	20	45
<u>AKERS</u>					
Avenue 272 to Avenue 276	8,800	61	15	25	60
Avenue 276 to Caldwell	16,700	65	25	50	110
Caldwell to Walnut	28,800	68	35	80	170
Walnut to Tulare	40,600	70	50	110	230
Tulare to SR 198	51,800	71	60	125	270
SR 198 to Goshen	49,500	71	60	125	270
Goshen to Ferguson	39,300	69	45	90	200
Ferguson to Riggins	19,600	66	25	60	125
Riggins to Avenue 316	14,800	64	20	45	90
Avenue 316 to Avenue 320	7,900	61	15	25	60
<u>DEMAREE</u>					
Avenue 272 to Avenue 276	21,500	66	25	60	125
Avenue 276 to SR 198	38,800	69	45	90	200
SR 198 to Goshen	50,000	71	60	125	270
Goshen to Ferguson	48,900	71	60	125	270
Ferguson to Riggins	36,800	69	45	90	200
Riggins to Avenue 316	28,100	68	35	80	170
Avenue 316 to Avenue 320	15,600	64	20	45	90
<u>MOONEY</u>					
Avenue 272 to Caldwell	84,800	74	90	200	430

*ROUNDED TO NEAREST FIVE FEET

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
Caldwell to Whitendale	93,500	74	90	200	430
Whitendale to Walnut	79,600	73	80	170	370
Walnut to Tulare	71,800	73	80	170	370
Tulare to SR 198	71,200	73	80	170	370
Goshen to Riffin	31,700	68	35	80	170
Riffin to Avenue 316	21,700	66	25	60	125
Avenue 316 to Avenue 320	9,800	62	15	30	70
<u>GIDDINGS</u>					
Whitendale to Tulare	14,500	64	20	45	90
Tulare to SR 198	23,000	67	30	70	145
<u>DINUBA</u>					
Avenue 216 to Avenue 316	48,400	71	60	125	270
<u>COURT</u>					
Avenue 272 to Avenue 276	40,200	70	50	110	230
Avenue 276 to Caldwell	47,400	70	50	110	230
Caldwell to Walnut	53,700	71	60	125	270
Walnut to Tulare	63,100	72	70	145	315
Tulare to SR 198	74,900	73	80	170	370
SR 198 to Avenue 216	71,300	73	80	170	370
Avenue 216 to Riffin	15,600	64	20	45	90
<u>BEN MADDOX</u>					
Avenue 272 to Caldwell	20,700	66	25	60	125
Caldwell to K Road	31,200	68	35	80	170
K Road to Walnut	44,200	70	50	110	230
Walnut to SR 198	53,500	71	60	125	270
SR 198 to Avenue 216	46,800	70	50	110	230
Avenue 216 to Riffin	35,700	69	45	90	200
<u>LOVERS LANE</u>					
Avenue 272 to Avenue 276	19,800	66	25	60	125
Avenue 276 Caldwell	36,900	69	45	90	200
Caldwell to K Road	32,900	69	45	90	200
K Road to SR 198	29,400	68	35	80	170
SR 198 to Goshen	35,800	69	45	90	200

*ROUNDED TO NEAREST FIVE FEET

TABLE 2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
Goshen to Avenue 216	22,200	66	25	60	125
Avenue 216 to St.Johns	11,600	63	15	35	80
St.Johns to Avenue 320	4,100	57	5	15	30
<u>ROAD 148/MC AULIFF</u>					
Avenue 272 to Caldwell	11,600	63	15	35	80
Caldwell to Walnut	15,200	64	20	45	90
Walnut to Tulare	22,000	66	25	60	125
Tulare to Goshen	22,200	66	25	60	125
Goshen to Avenue 216	16,800	65	25	50	110
Riggin to Avenue 320	5,800	59	10	20	45

*ROUNDED TO NEAREST FIVE FEET

CHAPTER 3

GOALS AND POLICIES

CHAPTER 3: GOALS AND POLICIES

3.1 GOALS

Noise Element goals are:

1. Protect citizens of Visalia from the harmful effects of exposure to excessive noise.
2. Protect the City's economic base by preventing the encroachment of incompatible land uses near known noise producing industries, railroads, airports and other sources.
3. Protect existing noise sensitive land uses from encroachment of and exposure to excessive levels of noise.

The goals of the Noise Element may be realized by pursuing the policies, and programs outlined in this Chapter.

3.2 LAND USE COMPATIBILITY GUIDELINES

Figure 2 is provided as a reference concerning the sensitivity of different land uses to their noise environment. It is intended to illustrate the range of noise levels which are allow the full range of activities normally associated with a given land use. For example, exterior noise levels in the range of 50-65 dB L_{dn} (or CNEL) or below are generally considered acceptable for residential land uses, since these levels will usually allow normal outdoor and indoor activities such as sleep and communication to occur without interruption. Industrial facilities, however, can be relatively insensitive to noise and may generally be located in a noise environment of up to 75 dB L_{dn} (or CNEL) without significant adverse effects.

3.3 GENERAL PLAN CONSISTENCY

Other elements of the Visalia General Plan contain policies or objectives which directly address noise issues in the community. The following is a summary of those policies which were in effect at the time of the Noise Element's adoption.

FIGURE 2
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE L _{dn} OR CNEL, dB						INTERPRETATION
	55	60	65	70	75	80	
RESIDENTIAL – LOW DENSITY SINGLE FAMILY, DUPLEX, MOBILE HOMES							NORMALLY ACCEPTABLE Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
RESIDENTIAL – MULTI. FAMILY							
TRANSIENT LODGING – MOTELS, HOTELS							CONDITIONALLY ACCEPTABLE New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
SCHOOLS, LIBRARIES, CHURCHES, HOSPITALS, NURSING HOMES							
AUDITORIUMS, CONCERT HALLS, AMPHITHEATRES							NORMALLY UNACCEPTABLE New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features - included in the design.
SPORTS ARENA, OUTDOOR SPECTATOR SPORTS							
PLAYGROUNDS, NEIGHBORHOOD PARKS							CLEARLY UNACCEPTABLE New construction or development should generally not be undertaken.
GOLF COURSES, RIDING STABLES, WATER RECREATION, CEMETERIES							
OFFICE BUILDINGS, BUSINESS COMMERCIAL AND PROFESSIONAL							
INDUSTRIAL, MANUFACTURING UTILITIES, AGRICULTURE							

CONSIDERATIONS IN DETERMINATION OF NOISE-COMPATIBLE LAND USE

A. NORMALIZED NOISE EXPOSURE INFORMATION DESIRED

Where sufficient data exists, evaluate land use suitability with respect to a "normalized" value of CNEL or L_{dn}. Normalized values are obtained by adding or subtracting the constants described in Table 1 to the measured or calculated value of CNEL or L_{dn}.

B. NOISE SOURCE CHARACTERISTICS

The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65 dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65 dB CNEL criterion wherever possible, and in order to facilitate the ability of airports to comply with the Act, residential uses located in Com-

munity Noise Exposure Areas greater than 65 dB should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS

One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL of L_{dn}. This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS

Another consideration, which in some communities is an overriding factor, is the desire for an acceptable outdoor noise environment. When this is the case, more restrictive standards for land use compatibility, typically below the maximum considered "normally acceptable" for that land use category, may be appropriate.

Land Use Element

- 4.1.5 Identify residential areas adjacent to roadways and other noise-sources (i.e., railroads, airport, industry) which require setbacks and/or special sound-proofing to reduce negative noise-related impacts, as identified in the Noise Element. Mitigation measures shall include the following:
- a. The performance standards of the City's Noise ordinance.
 - b. Noise mitigation "packages" including the use of setbacks to ensure that the exterior noise levels at the closest building facade do not exceed 65 dB Ldn and interior noise exposure of 45 dB Ldn or below.
 - c. For multi-family development, site design techniques shall be used to reduce the need for supplemental noise mitigation requirements. Also, investigate the feasibility of requiring greater setbacks for multi-family residential development along arterials and collectors as an alternative to walls and fences.
 - d. The City shall consider minimizing the development of new residential land uses in the area east of the industrial park and adjacent to other existing major commercial/industrial.
- 4.1.6 Develop design measures to buffer residential development from non-residential land uses. These measures should, at a minimum, include setbacks; roadways; community waterways; landscaping; and land forms such as berming, fences, and walls (See Conservation, Open Space, Recreation & parks Element's policies on Community Waterways, Wildlife and Natural vegetation, Open Space Resources, and Park Location and Design).
- 4.4.11 Promote comprehensively planned and high quality building and site design for multi-family developments with the following criteria:
1. Exterior-Evaluations - Use design features such as offsets, balconies, projections, landscaping or similar elements to preclude large expanses of uninterrupted building surfaces.
 2. Building, Parking, Walkway Separation - Provide privacy, light, air, and access to dwellings within the development by ensuring adequate distances among buildings, parking lots and driveways, and walkways.

Chapter 3: Goals and Policies

3. Open Space, Landscaping, and Screening - Designate private open space exclusive of required setbacks, right-of-way, and easements within each development for the use of residents. Open space, landscaping and screening should provide outdoor space for the residents and mitigate negative impacts related to land use compatibility between the development and adjacent land uses, noise, lighting, parking (screening and shading), on-site traffic circulation, and preservation of natural features such as waterways and Valley Oaks.
 4. Energy Efficiency - Encourage the following measures: 1) appropriate landscaping materials to provide shade in the summer and protection from the weather in winter; 2) eaves, canopies, awnings along south and west elevations; 3) secured bicycle storage areas with lock-up capabilities.
- 4.1.16 Require special site development standards for proposed non-residential or more intensive land uses adjacent to established residential areas to minimize negative impacts on abutting properties.
- 5.6 A. Plan and develop a transportation system for Visalia which contributes to community livability, recognizes and respects community characteristics (natural and man-made), and minimizes negative impacts on adjacent land uses.
- 5.6.3 Develop and implement the Visalia Parkway to supplement the City's arterial/collector grid and to be a community image feature. Development and improvements guidelines shall include:
- a. A minimum of 150'-wide right-of-way with at least two travel lanes in either direction, controlled access, special median and right-of-way landscaping.
 - b. Adequate right-of-way for high-occupancy-vehicle and/or dedicated mass transit (e.g. bus, light rail) lanes.
 - c. Adequate right-of-way and development standards to permit effective mitigation of noise, glare, and circulation impacts.

Chapter 3: Goals and Policies

- d. Grade-separated crossings, on- and off-ramps and special landscaping treatments shall be utilized at the parkway's intersection with State Highway 198 and with Mooney Boulevard.
- e. Pending development of the Visalia parkway north of the St. John's River, the St. John's Parkway from McAuliff to Dinuba Boulevard shall serve as the northerly Parkway connector.

- 7.2.1 Protect the airport and its operational area from potential intrusion of incompatible land uses by strictly regulating development within the airport's operating area according to the Airport Master Plan, the Airport Compatibility Map and guidelines contained in the Airport Compatibility Criteria Table.

These policies are incorporated by reference. If the source documents are changed by subsequent amendment, the policies stated herein shall also change.

3.4 POLICIES

The following policy statements reflect Visalia's commitment to the noise element goals outlined above:

1.0 General Policies

- 1.1 Areas within Visalia shall be recognized as noise impacted if exposed to existing or projected future noise levels at the exterior of buildings which exceed 65 dB L_{dn} (or CNEL).
- 1.2 New development of residential or other noise sensitive land uses shall be avoided in noise impacted areas unless effective mitigation measures are incorporated into the specific design of such projects to reduce exterior noise levels to 65 dB L_{dn} (or CNEL) or less and 45 dB L_{dn} (or CNEL) or less within interior living spaces.
- 1.3 New development of industrial, commercial or other noise generating land uses (including roadways, railroads, and airports) should be discouraged if resulting noise levels will exceed 65 dB L_{dn} (or CNEL) at the boundary areas of planned or zoned residential or other noise sensitive land uses.

Chapter 3: Goals and Policies

- 1.4 Noise level criteria applied to land uses other than residential land uses or other noise-sensitive uses shall be consistent with the recommendations of the California Office of Noise Control (Figure 2).
- 1.5 Visalia shall enforce applicable State Noise Insulation Standards (California Administrative Code, Title 24) and Uniform Building Code (UBC) noise requirements.
- 1.6 New equipment and vehicles purchased by the City should comply with noise level performance standards consistent with the best available noise reduction technology.
- 1.7 In conformance with the directives of State planning law, the City shall ensure that the Noise Element is consistent with and does not conflict with other elements of the City's General Plan.
- 1.8 The land use compatibility zone guidelines contained in the Airport Master Plan and the West Visalia Specific Plan shall be used to assess noise compatibility of airport operation with proposed land uses.
- 1.9 The preferred method of noise control should, when possible, be the thoughtful location and orientation of noise generating and noise received. Secondly, noise control should be achieved through the use of artificial noise barriers.

2.0 **Implementation Policies**

- 2.1 The City shall review all relevant development plans, programs and proposals to ensure their conformance with the policy framework outlined in this Noise Element.
- 2.2 Prior to the approval of a proposed development in a noise impacted area, or the development of an industrial, commercial or other noise generating land use in or near an area containing existing or planned noise sensitive land uses, an acoustical analysis may be required if all of the following findings are made:
 - a. The existing or projected future noise exposure at the exterior of buildings which will contain noise sensitive uses or within proposed outdoor activity areas (patios, decks, backyards, pool areas, recreation areas, etc.) exceeds 65 dB L_{dn} (or CNEL).

Chapter 3: Goals and Policies

- b. Interior noise levels resulting from offsite noise are estimated to exceed 45 dBA.
- c. Estimated or projected noise levels cannot be reduced to the noise exposure limitations specified in this Noise Element by the application of Standard Noise Reduction Methods described in Appendix C.

CHAPTER 4

IMPLEMENTATION PROGRAM

CHAPTER 4: IMPLEMENTATION PROGRAM

In order to achieve compliance with the policies of the Noise Element, Visalia shall undertake the following Implementation Program. The Implementation Program focuses on methods to reduce noise related land use conflicts by outlining methods that can be used in relevant development plans, programs and proposals to adequately address noise and its potential effects.

Resource information available to the City for use in the review process includes the noise exposure maps for the year 2020. The noise exposure maps are intended to be used as a screening device in determining if a noise sensitive land use may be exposed to excessive noise levels and to provide guidance in the long range planning process. Generally, the noise exposure maps provide a conservative (worst-case) assessment of noise exposure for the major noise sources identified. It is likely that other major sources of noise will be identified during the project review process. This will be especially true of industrial or commercial sources since only a small number of such sources were evaluated during the preparation of this document.

The purpose of the Implementation Program is to establish guidelines for determining whether or not proposed noise mitigation measures are a reasonable application of the techniques available, and likely to achieve the desired results. This Noise Element prescribes that noise impacts should be attenuated, to the maximum degree possible, through effective site. Where necessary, other methods, or combinations of methods, may be employed as follows:

A. Standard Noise Reduction Methods

1. Setbacks.
2. Walls and barriers.
3. Landscaping.
4. Special building materials and systems.
5. Site and building design.

B. Other methods or techniques which are shown to be effective.

In special cases where it can not be determined whether or not a project will comply with the provisions of the Noise Element, an acoustical analysis may be required to verify compliance or to identify necessary mitigation measures. Such acoustical analysis would only be required where compliance cannot be demonstrated utilizing the Standard Noise Reduction Methods or other techniques acceptable to the City.

If a project cannot demonstrate compliance with the requirements of the Noise Element through usage of the Standard Noise Reduction Methods or other means acceptable to the City, the Planning Director may require an acoustical analysis. When an acoustical analysis is required, it should:

- a. Be the responsibility of the applicant.
- b. Be prepared by an individual or firm with demonstrable experience in the fields of environmental noise assessment and architectural acoustics.
- c. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
- d. Include estimated noise levels in terms of L_{dn} (or CNEL) for existing and projected future (10-30 year hence) conditions, with a comparison made to the adopted policies of the Noise Element.
- e. Include recommendations for appropriate mitigation measures to achieve compliance with the adopted policies and standards of the Noise Element.
- f. Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the project must be provided.
- g. The acoustical analysis should be prepared as early in the project review or permitting process as possible, so that noise mitigation measures may be an integral part of the project design rather than an afterthought.

APPENDIX A

ACOUSTICAL TERMINOLOGY

APPENDIX A

GLOSSARY

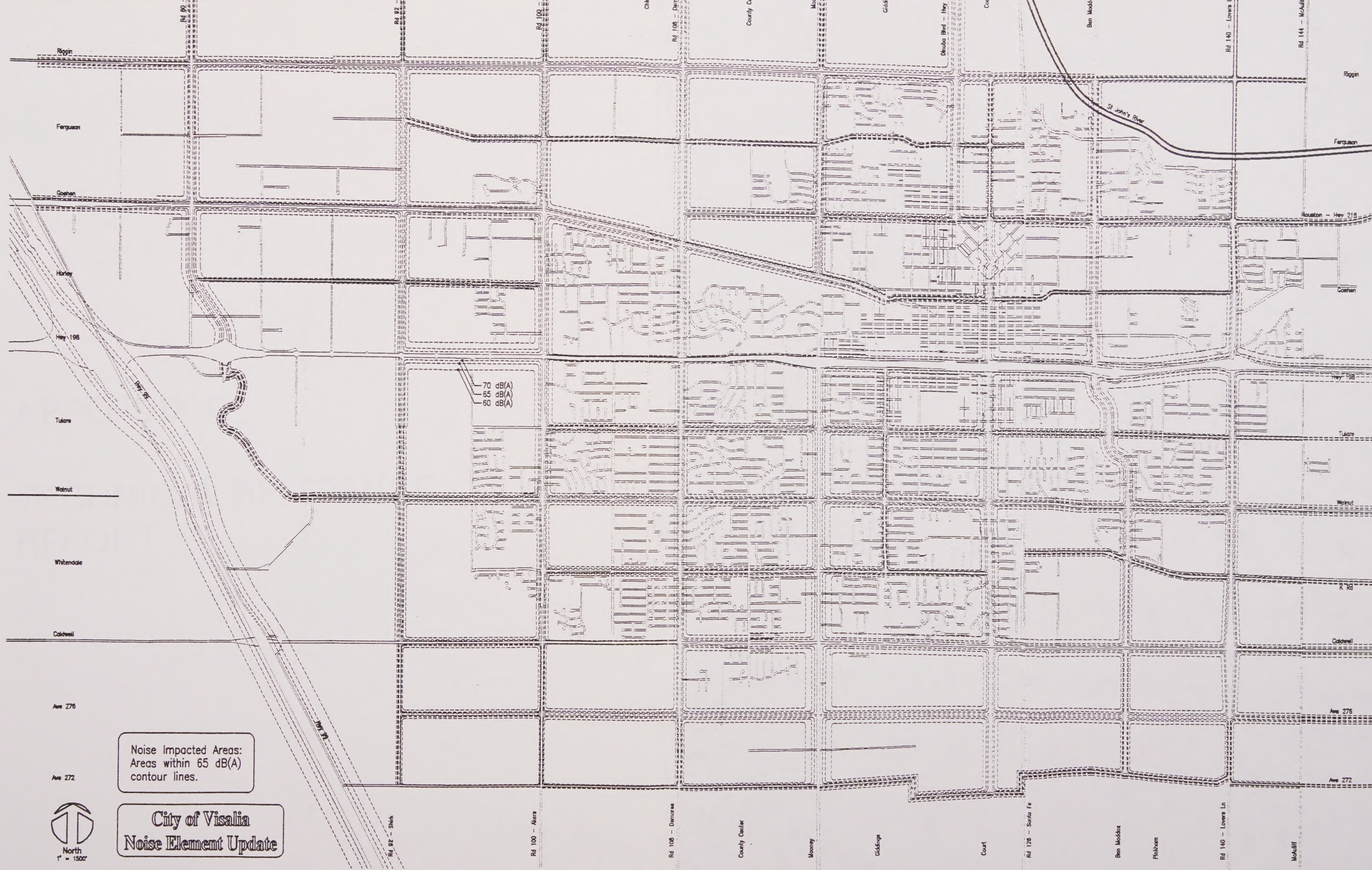
ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL	The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.
A-WEIGHTED SOUND LEVEL	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.
CNEL	Community Noise Equivalent Level. The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.
DECIBEL, dB	A unit for describing the amplitude of sound, equal to twenty times the logarithm to the base ten of the ratio of the pressure of the sound measured to the reference pressure, which is twenty micropascals (twenty micronewtons per square meter).
EQUIVALENT ENERGY LEVEL, L_{eq}	The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over one, eight and twenty-four-hour sample periods.
L_{dn}	Day/Night Average Level. The average equivalent A-weighted sound level during a twenty-four-hour day, obtained after addition of ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

$L_{\max}$	The maximum A-weighted noise level recorded during a noise event.
L_n	The sound level exceeded "n" percent of the time during a sample interval. L_{10} equals the level exceeded ten percent of the time (L_{90} , L_{50} , etc.)
Line Source	A continuous noise source which occupies at least an angle of at least 115 degrees from the noise receiver.
Noise Exposure Contours	Lines drawn about a noise source indicating constant energy levels of noise exposure. CNEL and L_{dn} are the descriptors utilized herein to describe community exposure to noise.
Point Source	Noise emanating from a single point or from a collection of points which occupies less than 115 degrees from the noise receiver.

APPENDIX B

NOISE EXPOSURE MAPS



APPENDIX C

TECHNICAL REFERENCE REPORT

APPENDIX C

TECHNICAL REFERENCE REPORT

1.0 INTRODUCTION

This Appendix provides background information concerning the methods and data used in the preparation of the Noise Element. It is intended that the Technical Reference Appendix be used by Visalia as a resource when evaluating the noise-related implications of specific development proposals or long-range planning efforts.

2.0 NOISE AND ITS EFFECTS ON PEOPLE

2.1 Noise Assessment

Noise is often defined simply as unwanted sound, and thus is a subjective reaction to characteristics of a physical phenomenon. The descriptors of community noise in current use are the result of many years of effort to translate objective measurements of sound into measures of subjective reaction to noise. Before elaborating on these descriptors, it is useful to discuss some fundamental concepts of sound.

Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least twenty times per second), they can be heard and hence are called sound. The number of pressure variations per second is called the frequency sound, and is expressed as cycles per second, now called Hertz (Hz) by international agreement.

The speed of sound in air is approximately 770 miles per hour, or 1,130 feet/second. Knowing the speed and frequency of a sound, one may calculate its wavelength, the physical distance in air from one compression of the atmosphere to the next. An understanding of wavelength is useful in evaluating the effectiveness of physical noise control devices such as mufflers or barriers, which depend upon either absorbing or blocking sound waves to reduce sound levels.

To measure sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel (dB) scale was devised. The decibel scale uses the hearing threshold as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken

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to keep the numbers in a practical range. Use of the decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. In the range of usual environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighting the frequency response of a sound level measurement device (called a sound level meter) by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. Figure C-1 illustrates typical A-weighted sound levels due to recognizable sources.

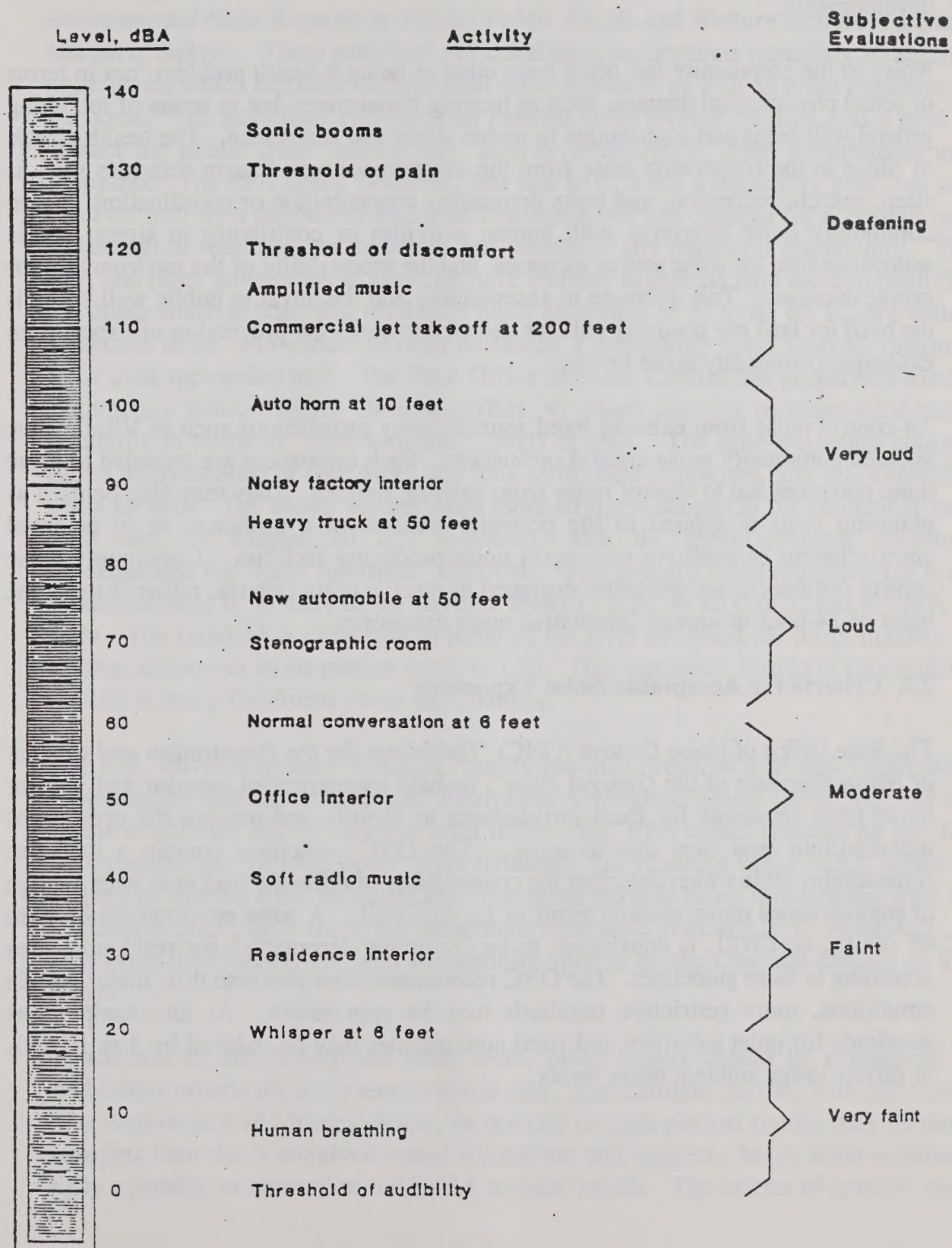
It is common to describe community noise in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which is the sound level corresponding to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, and shows very good correlation with community response to noise.

Two composite noise descriptors are in common use today: L_{dn} and CNEL. The L_{dn} (day-night average level) is based upon the average hourly L_{eq} over a 24-hour day, with a +10 decibel weighting applied to nighttime (10:00 p.m. to 7:00 a.m.) L_{eq} values. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were subjectively twice as loud as daytime exposures. The CNEL (Community Noise Equivalent Level), like L_{dn} , is also based upon the weighted average hourly L_{eq} over a 24-hour day, except that an additional 4.77 decibel penalty is applied to evening (7:00 p.m. to 10:00 p.m.) hourly L_{eq} values.

The CNEL was developed for the California Airport Noise Regulations, and is applied specifically to airport/aircraft noise assessment. The L_{dn} scale is a simplification of the CNEL concept, but the two will usually agree, for a given situation, within 1 dB. Like the L_{eq} , these descriptors are also averages and tend to disguise variations in the noise environment. Because L_{dn} and CNEL presume increased evening or nighttime

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Figure C-1
Examples of Noise Levels



sensitivity, they are best applied as criteria for land uses where nighttime noise exposures are critical to the acceptability of the noise environment, such as residential developments.

Noise in the community has often been cited as being a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from the interference with human activities such as sleep, speech, recreation, and tasks demanding concentration or coordination. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases, and the acceptability of the environment for people decreases. This decrease in acceptability and the threat to public well-being is the basis for land use planning policies directed towards the prevention of exposure to excessive community noise levels.

To control noise from existing fixed sources many jurisdictions such as Visalia have adopted community noise control ordinances. Such ordinances are intended to abate noise nuisances and to control noise from existing sources. They may also be used as planning tools if applied to the potential creation of a nuisance, or to potential encroachment of sensitive uses upon noise-producing facilities. Community noise control ordinances are generally designed to resolve noise criteria, rather than on the basis of 24-hour or annual cumulative noise exposures.

2.2 Criteria for Acceptable Noise Exposures

The State Office of Noise Control (ONC) *"Guidelines for the Preparation and Content of Noise Elements of the General Plan"*, include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The ONC guidelines contain a land use compatibility table which describes the compatibility of different land uses with a range of environmental noise levels in terms of L_{dn} or CNEL. A noise environment of 50 to 65 dB L_{dn} or CNEL is considered to be "normally acceptable" for residential uses according to those guidelines. The ONC recommendations also note that, under certain conditions, more restrictive standards may be appropriate. As an example, the standards for quiet suburban and rural communities may be reduced by 5 to 10 dBA to reflect lower ambient noise levels.

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The U.S. Environmental Protection Agency (EPA) also prepared guidelines for community noise exposure in the publication *"Information on the Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety"*. These guidelines are based upon assumptions regarding acceptable noise levels which consider occupational noise exposure as well as noise exposure in the home. The guidelines recognize an exterior noise level of 55 dB L_{dn} as a goal to protect the public from hearing loss, activity interference, sleep disturbances and annoyance. The EPA notes, however, that this level is not a regulatory goal, but is a level defined by a negotiated scientific consensus without concern for economic and technological feasibility or the needs and desires of any particular community. The EPA and other governmental agencies have adopted suggested land use compatibility guidelines which indicate that residential noise exposures of 55 to 65 dB L_{dn} are within acceptable limits. For control of noise nuisances, a community noise control ordinance is the most appropriate tool. The State Office of Noise Control has prepared a Model Community Noise Control Ordinance (Ref. 4) which contains recommended noise standards in terms of "time-weighted" levels in dBA. The time-weighting concept allows discrimination of both short- and long-term noise exposures, and sets allowable levels for each. The Model recommends more stringent standards for residential land uses than for commercial and industrial, with the most stringent standards recommended for "rural suburban" situations. The primary noise standards for rural residential uses is 50 dBA in the daytime hours (7 a.m. to 10 p.m.), and 40 dBA at night. The standard is expressed in terms of the level exceeded for thirty minutes of an hour, equivalent to the median level, or L_{50} . This ordinance format is successfully applied in many California cities and counties.

The U.S. Environmental Protection Agency has also prepared a Model Community Noise Control Ordinance, using the "Equivalent A-weighted Sound Level" (L_{eq}) as the means of defining allowable noise level limits. The EPA model contains no specific recommendations for local noise level standards, but reports a range of L_{eq} values as adopted by various local jurisdictions. The mean daytime noise standard reported by the EPA is 56.75 dBA (L_{eq}); the mean nighttime noise standard is 51.76 dBA (L_{eq}). This ordinance format has been successfully applied by the City and County of San Diego.

In addition to the A-weighted noise level, other factors should be considered in establishing criteria for noise sensitive land uses. For example, sounds with noticeable tonal content such as whistles, horns, or droning or high-pitched sounds may be more annoying than the A-weighted sound level alone will suggest. Many noise standards apply a penalty, or correction, of 5 dBA to such sounds. The effects of unusual tonal

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content will generally be more of a concern at nighttime, when residents may notice the sound in contrast to previously-experienced background noises.

Because many rural residential areas experience very low noise levels, residents may express concern about the loss of "peace and quiet" due to the introduction of a sound which was not audible previously. In very quiet environments, the introduction of virtually any change in local activities will cause an increase in noise levels. A change in noise levels and the relative loss of "peace and quite" is the inevitable result of land use or activity changes in such areas. Audibility of a new noise source and/or increase in noise levels within recognized acceptable limits are not usually considered to be significant noise impacts, but these concerns should be addressed and considered in the planning and environmental review processes.

Table C-1 is commonly used to show expected public reaction to changes in environmental noise levels. This table was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise, or to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dBA, the usual range of voice and interior noise levels. It is probably not directly applicable to public perception of identifiable intrusive noise sources in very quiet environments because of the differences in frequency content between background noise sources and intrusive sounds, as well as the fact that the absolute amount of energy required to make a given change in sound pressure level is much smaller at low noise levels than at higher levels. Table C-1 should, therefore, only be applied in a general manner to show the relationship between changes in sound energy, sound pressure levels and subjective reaction.

TABLE C-1
SUBJECTIVE REACTION TO CHANGES IN NOISE LEVELS OF SIMILAR SOURCES

Increase in Sound Pressure Level, dBA	Relative Increase in Acoustical Energy	Subjective Reaction
1	1.26 times	Minimum Detectable Change (Lab)
3	2.00 times	Usually Noticeable Change
5	3.20 times	Definitely Noticeable Change
10	10.00 times	Twice as Loud as Before

Sources: Various, reported by Brown-Buntin Associates, Inc.

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The comparisons of subjective reaction outlined in Table C-1 are not applicable to noise exposures which are very quiet or very loud. For example, a whisper which is increased by 10 decibels, e.g., from 20 dBA to 30 dBA, remains a whisper, and would still be described as quiet. In contrast, an increase in the noise level of a diesel locomotive from 90 dBA to 100 dBA would be a change from a loud noise to a very loud noise. Thus the subjective reaction to a 10 dBA change in either case may be different, even though the change in level is the same.

3.0 EXISTING AND FUTURE NOISE ENVIRONMENT

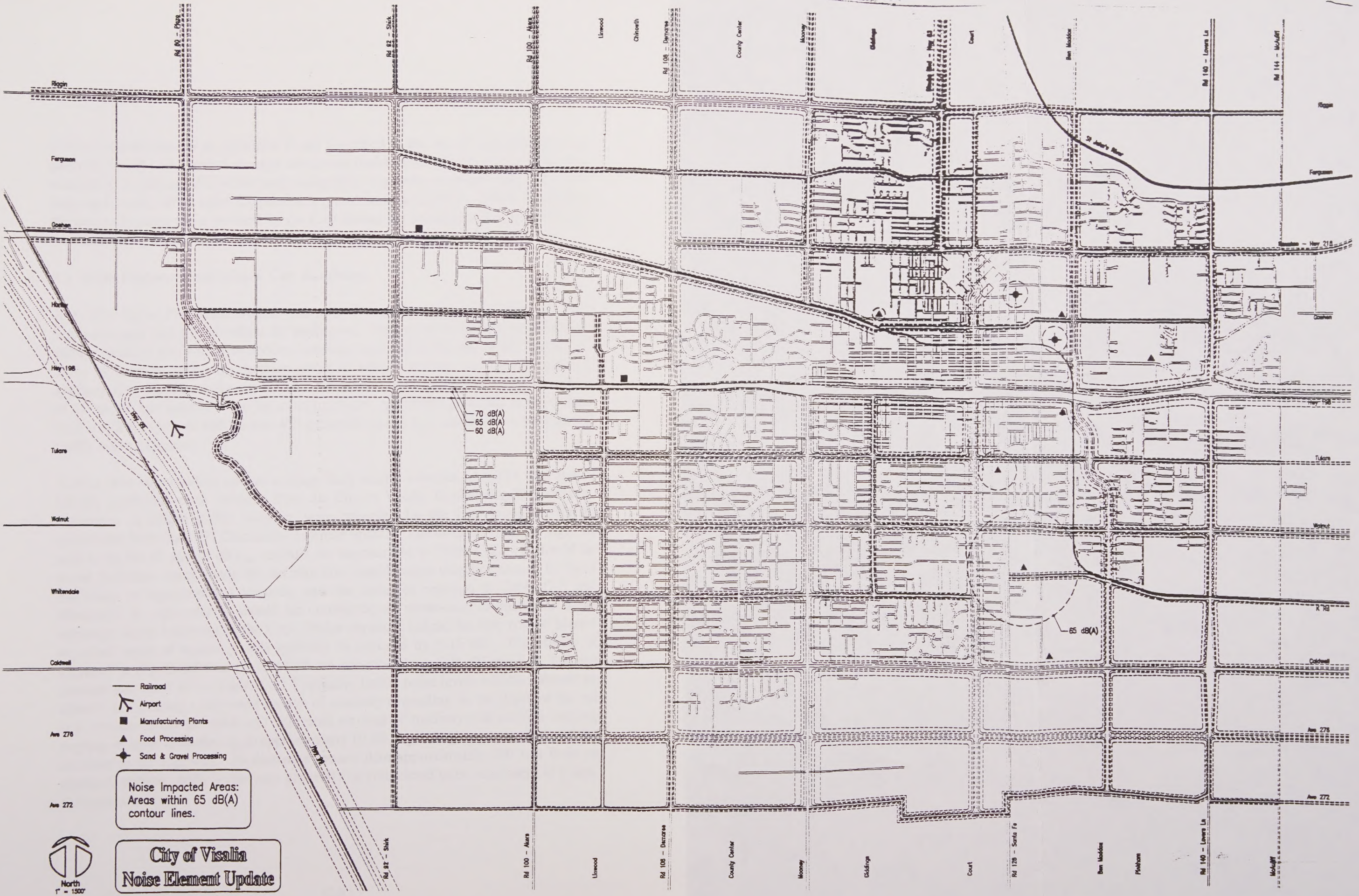
3.1 Overview of Sources

Based on discussions with City of Visalia staff, on information provided by questionnaires completed by Tulare County on field studies conducted by Brown-Buntin Associates (BBA), it was determined that there are a number of potentially significant sources of community noise within Visalia. These sources included traffic on State highways, major City streets, railroad operations, airport operations, industrial facilities, and agricultural activities. Specific noise sources selected for study are discussed in the following sections. Figure C-2 shows the generalized locations of major noise sources selected for study, and for which generalized L_{dn} contours have been prepared.

3.2 Methods and Noise Exposure Maps

Analytical noise modeling techniques in conjunction with actual field noise level measurements were used to develop generalized L_{dn} for the year 2020. Analytical noise modeling techniques generally make use of source-specific data including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Analytical methods have been developed for many environmental noise sources including roadways, railroad line operations, railroad yard operations, industrial plants and aircraft/airport operations. Such methods will produce reliable results as long as data inputs and assumptions are valid for the sources being studied. The analytical methods used in this report closely follow recommendations made by the State Office of Noise Control, and were supplemented where appropriate by source-specific noise level data to account for local conditions.

Noise exposure contours for major roadways and fixed point sources within the City are contained within Appendix B. The maps depict noise exposure in the City and noise impacted areas (areas which exceed 65 dBA). It should be noted that the L_{dn} or



Noise Impacted Areas:
Areas within 65 dB(A)
contour lines.

City of Visalia
Noise Element Update



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CNEL contours shown in Appendix B and described in the text of this document are generally based upon annual average conditions (unless otherwise noted), and are not intended to be site-specific where local topography, vegetation or intervening structures may significantly affect noise exposure at a given receiver location. It is intended that the noise exposure maps be used by the City during the implementation of the Noise Element through the project review and long-range planning process.

3.3 State Highways and Major City Roadways

A Traffic Noise Prediction Model was used to develop L_{dn} contours for the State highways, and city streets within the study area. The model is based upon reference energy emission levels for automobiles, medium trucks (2-axles) and heavy trucks, (3-axles or greater) with consideration given to vehicle volume and speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. Use of the model has indicated that for most roadways, the model generally over predicts traffic noise exposure and its use will generally result in a conservative estimate of traffic noise exposure.

Traffic data representing annual average daily traffic volumes (AADT), and future (2020) conditions were obtained from the City of Visalia Engineering Department. Estimates of future traffic volumes were provided by the City based on traffic projections from the 1995 Circulation Element update. The distance from the right of way to the 60, 65 and 70 dB L_{dn} contours are summarized in Table C-2. It should be noted that these calculations did not take into consideration shielding caused by local buildings or topographical features, and the distances reported in Table C-2 and illustrated in Appendix B should be considered as worst-case estimates of noise exposure along roadways in the City. Noise exposure behind the first row of houses or other types of buildings will typically be reduced by 5-15 dB. The effects of elevated or depressed roadways, which are common along S.R. 99 and S.R. 198 are also not accounted for in Table C-2. Typically, traffic noise levels will be reduced by about 5-12 dB along a depressed section of roadway depending on the depth of the cut and distance from the roadway. Elevated sections of roadway will provide varying degrees of noise reduction up to approximately 10 dB depending upon proximity of the receiver to the roadway. At distances greater than approximately 300 feet from an elevated roadway, noise levels may generally be considered to be equivalent to a non-elevated roadway.

TABLE C-2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
AVENUE 320					
Plaza to Shirk	6,400	60	10	25	50
Shirk to Akers	9,600	62	15	30	70
Akers to Demaree	11,800	63	15	35	80
Demaree to Mooney	9,800	62	15	30	70
Mooney to Dinuba	11,800	63	15	35	80
Dinuba to Ben Maddox	8,300	61	15	25	60
Ben Maddox to McAuliff	4,900	58	10	15	35
McAuliff to Rd. 156	2,800	55	5	10	25
AVENUE 316					
Shirk to Akers	3,200	56	5	15	25
Akers to Chinowth	6,700	60	10	25	50
Chinowth to Demaree	6,200	59	10	20	45
Demaree to Mooney	4,800	58	10	15	35
Mooney to Giddings	5,200	59	10	20	45
Giddings to Dinuba	7,300	60	10	25	50
RIGGIN					
(Betty) 99 to Plaza	32,300	68	35	80	170
Plaza to Rd 88	37,000	69	45	90	200
Rd 88 to Akers	47,500	71	60	125	270
Akers to Demaree	47,800	71	60	125	270
Demaree to Mooney	57,300	72	70	145	315
Mooney to Dinuba	58,500	72	70	145	315
Dinuba to Court	34,400	69	45	90	200
Court to Ben Maddox	24,400	67	30	70	145
Ben Maddox to Lovers Lane	10,200	62	15	30	70
Lovers Lane to McAuliff	6,300	60	10	25	50
McAuliff to Road 148	4,000	57	5	15	30
FERGUSON					
Shirk to Akers	14,100	64	20	45	90
Akers to Demaree	7,500	60	10	25	50
Demaree to Mooney	8,900	61	15	25	60
Mooney to Dinuba	9,500	62	15	30	70
Dinuba to Santa Fe	10,600	62	15	30	70
DOE					
Demaree to Mooney	28,000	68	35	80	170
Mooney to Dinuba	25,800	67	30	70	145
Dinuba to Court	21,900	66	25	60	125
Court too Santa Fe	17,500	65	25	50	110
Santa Fe to Ben Maddox	29,900	68	35	80	170
Ben Maddox to Lovers Lane	21,500	66	25	60	125
Lovers Lane to McAuliff	18,500	65	25	50	110
McAuliff to Road 152	13,300	64	20	45	90
GOSHEN					
Hwy 99 to Road 78	27,000	67	30	70	145
Road 78 to Road 80	50,800	71	60	125	270
Road 80 to Shirk	40,100	70	50	110	230
Shirk to Akers	41,500	70	50	110	230
Akers to Chinowth	47,700	71	60	125	270
Chinowth to Demaree	31,600	68	35	80	170
Demaree to Giddings	35,400	69	45	90	200
Giddings to Dinuba	13,300	64	20	45	90
Dinuba to Court	23,600	67	30	70	145
Court to Santa Fe	9,900	62	15	30	70
Santa Fe to Ben Maddox	6,400	60	10	25	50

*ROUNDED TO NEAREST FIVE FEET

**TABLE C-2
NOISE CONTOUR ESTIMATES**

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
Ben Maddox to Lovers Lane	7,300	60	10	25	50
HURLEY					
Plaza to Road 88	7,500	60	10	25	50
Road 88 to Shirk	9,300	62	15	30	70
Shirk to Akers	15,900	65	25	50	110
Akers to Chinowth	13,100	64	20	45	90
HWY 198					
Shirk to Akers	92,000	74	90	200	430
Akers to Chinowth	6,700	60	10	25	50
Chinowth to Demaree	9,300	62	15	30	70
Demaree to Mooney	10,400	62	15	30	70
Mooney to court	80,200	73	80	170	370
Court to Ben Maddox	80,200	73	80	170	370
Ben Maddox to Lovers Lane	83,200	74	90	200	430
Lovers Lane to Road 148	69,400	73	80	170	370
Road 148 to Road 152	51,400	71	60	125	270
TULARE AVENUE					
Akers to Demaree	21,000	66	25	60	125
Demaree to Mooney	29,300	68	35	80	170
Mooney to Court	30,100	68	35	80	170
Court to Ben Maddox	19,900	66	25	60	125
Ben Maddox to Pinkham	16,200	65	25	50	110
Pinkham to Lovers Lane	8,600	61	15	25	60
Lovers Lane to McAuliff	6,800	60	10	25	50
McAuliff to Road 148	3,200	56	5	15	25
WALNUT					
Plaza to Shirk	24,600	67	30	70	145
Shirk to Akers	29,800	68	35	80	170
Akers to Demaree	28,200	68	35	80	170
Demaree to Mooney	28,300	68	35	80	170
Mooney to Giddings	33,100	69	45	90	200
Giddings to Court	33,500	69	45	90	200
Court to Ben Maddox	31,600	68	35	80	170
Ben Maddox to Lovers Lane	28,000	68	35	80	170
Lovers Lane to Road 148	24,000	67	30	70	145
WHITENDALE					
Akers to Demaree	19,800	66	25	60	125
Demaree to County Center	22,900	67	30	70	145
County Center to Mooney	32,200	68	35	80	170
Mooney to Giddings	26,400	67	30	70	145
Giddings to Court	12,800	63	15	35	80
K ROAD					
Santa Fe to Ben Maddox	17,100	65	25	50	110
Ben Maddox to Lovers Lane	15,000	64	20	45	90
Lovers Lane to McAuliff	10,400	62	15	30	70
McAuliff to Road 148	4,400	58	10	15	35
CALDWELL					
Shirk to Akers	23,200	67	30	70	145
Akers to Demaree	3,300	56	5	15	25
Demaree to County Center	41,800	70	50	110	230
County Center to Mooney	62,400	72	70	145	315
Mooney to Court	66,600	72	70	145	315
Court to Ben Maddox	54,000	71	60	125	270
Ben Maddox to Lovers Lane	43,000	70	50	110	230
Lovers Lane to McAuliff	26,900	67	30	70	145

*ROUNDED TO NEAREST FIVE FEET

**TABLE C-2
NOISE CONTOUR ESTIMATES**

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
McAuliff to Road 156	34,000	69	45	90	200
<u>AVENUE 276</u>					
Shirk to Akers	19,600	66	25	60	125
Akers to Demaree	29,200	68	35	80	170
Demaree to Mooney	40,200	70	50	110	230
Mooney to Court	54,200	71	60	125	270
Court to Ben Maddox	45,200	70	50	110	230
Ben Maddox to Lovers Lane	46,400	70	50	110	230
Lovers Lane to McAuliff	28,600	68	35	80	170
McAuliff to Road 148	19,600	66	25	60	125
<u>AVENUE 272</u>					
Shirk to Akers	1,500	52	5	5	15
Akers to Demaree	6,200	59	10	20	45
Demaree to Mooney	13,300	64	20	45	90
Mooney to Court	24,100	67	30	70	145
Court to Ben Maddox	18,900	66	25	60	125
Ben Maddox to Lovers Lane	16,000	65	25	50	110
Lovers Lane to McAuliff	9,100	62	15	30	70
McAuliff to Road 148	3,400	56	5	15	25
<u>HWY 99</u>					
Avenue 320 to Midvalley	163,800	77	145	315	680
<u>PLAZA</u>					
Walnut to SR 198	20,000	66	25	60	125
SR 198 to Hurley	65,900	72	70	145	315
Hurley to Goshen	59,200	72	70	145	315
Goshen to Avenue 308	46,800	70	50	110	230
Avenue 308 to Riggins	34,300	69	45	90	200
Riggins to Avenue 320	24,200	67	30	70	145
Avenue 320 to Avenue 328	32,900	69	45	90	200
<u>SHIRK</u>					
Avenue 272 to Caldwell	11,400	63	15	35	80
Caldwell to Walnut	29,400	68	35	80	170
Walnut to Tulare	24,200	67	30	70	145
Tulare to SR 198	33,100	69	45	90	200
SR 198 to Goshen	42,500	70	50	110	230
Goshen to Riggins	43,900	70	50	110	230
Riggins to Avenue 316	8,500	61	15	25	60
Avenue 316 to Avenue 320	5,700	59	10	20	45
<u>AKERS</u>					
Avenue 272 to Avenue 276	8,800	61	15	25	60
Avenue 276 to Caldwell	16,700	65	25	50	110
Caldwell to Walnut	28,800	68	35	80	170
Walnut to Tulare	40,600	70	50	110	230
Tulare to SR 198	51,800	71	60	125	270
SR 198 to Goshen	49,500	71	60	125	270
Goshen to Ferguson	39,300	69	45	90	200
Ferguson to Riggins	19,600	66	25	60	125
Riggins to Avenue 316	14,800	64	20	45	90
Avenue 316 to Avenue 320	7,900	61	15	25	60
<u>DEMAREE</u>					
Avenue 272 to Avenue 276	21,500	66	25	60	125
Avenue 276 to SR 198	38,800	69	45	90	200
SR 198 to Goshen	50,000	71	60	125	270
Goshen to Ferguson	48,900	71	60	125	270
Ferguson to Riggins	36,800	69	45	90	200

*ROUNDED TO NEAREST FIVE FEET

TABLE C-2
NOISE CONTOUR ESTIMATES

STREET/CROSS STREET	ADT YR 2020	dB(A) @ 50'	Distance (feet) to		
			70 dB(A)*	65 dB(A)*	60 dB(A)*
Riggin to Avenue 316	28,100	68	35	80	170
Avenue 316 to Avenue 320	15,600	64	20	45	90
MOONEY					
Avenue 272 to Caldwell	84,800	74	90	200	430
Caldwell to Whitendale	93,500	74	90	200	430
Whitendale to Walnut	79,600	73	80	170	370
Walnut to Tulare	71,800	73	80	170	370
Tulare to SR 198	71,200	73	80	170	370
Goshen to Riggin	31,700	68	35	80	170
Riggin to Avenue 316	21,700	66	25	60	125
Avenue 316 to Avenue 320	9,800	62	15	30	70
GIDDINGS					
Whitendale to Tulare	14,500	64	20	45	90
Tulare to SR 198	23,000	67	30	70	145
DINUBA					
Avenue 216 to Avenue 316	48,400	71	60	125	270
COURT					
Avenue 272 to Avenue 276	40,200	70	50	110	230
Avenue 276 to Caldwell	47,400	70	50	110	230
Caldwell to Walnut	53,700	71	60	125	270
Walnut to Tulare	63,100	72	70	145	315
Tulare to SR 198	74,900	73	80	170	370
SR 198 to Avenue 216	71,300	73	80	170	370
Avenue 216 to Riggin	15,600	64	20	45	90
BEN MADDOX					
Avenue 272 to Caldwell	20,700	66	25	60	125
Caldwell to K Road	31,200	68	35	80	170
K Road to Walnut	44,200	70	50	110	230
Walnut to SR 198	53,500	71	60	125	270
SR 198 to Avenue 216	46,800	70	50	110	230
Avenue 216 to Riggin	35,700	69	45	90	200
LOVERS LANE					
Avenue 272 to Avenue 276	19,800	66	25	60	125
Avenue 276 Caldwell	36,900	69	45	90	200
Caldwell to K Road	32,900	69	45	90	200
K Road to SR 198	29,400	68	35	80	170
SR 198 to Goshen	35,800	69	45	90	200
Goshen to Avenue 216	22,200	66	25	60	125
Avenue 216 to St.Johns	11,600	63	15	35	80
St.Johns to Avenue 320	4,100	57	5	15	30
ROAD 148/MC AULIFF					
Avenue 272 to Caldwell	11,600	63	15	35	80
Caldwell to Walnut	15,200	64	20	45	90
Walnut to Tulare	22,000	66	25	60	125
Tulare to Goshen	22,200	66	25	60	125
Goshen to Avenue 216	16,800	65	25	50	110
Riggin to Avenue 320	5,800	59	10	20	45

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3.4 Railroads

Railroad operations in Visalia consist of operations on the Atchison, Topeka, and Santa Fe (A.T. & S.F.) Railroad and on the Southern Pacific Transportation Company (SPTCo.) Railroad along S.R. 99.

Noise levels from mainline operations within Visalia were quantified using the analytical methods developed in 1973 by Wyle Laboratories Report WCR-73-5). The Wyle methodology calculates noise exposure based upon reference noise level data for various types of trains under different operating conditions, distance from the tracks, speed and the characteristics of the track the trains are passing over.

In order to provide a comparison of the noise levels predicted by the Wyle methodology to those actually occurring in Visalia, and to document single-event noise levels, noise level measurements were conducted at various locations near or away from grade crossings. Sound level measurement equipment consisted of Bruel & Kjaer (B&K) Type 2230 and 2218 integrating sound level meters equipped with B&K Type 4155 and 4165 1/2" microphones, respectively. All equipment was calibrated in the field prior to use with B&K Type 4230 acoustical calibrators, and complies with all applicable standards of the American National Standards Institute (ANSI) for Type I (precision) sound level meters. The reference measurement distance was 100 feet from the center of the tracks. Specific noise level data are described in the following sections describing operations for each railroad.

A.T. & S.F. Railroad

Branchline operations on the A.T. & S.F. Railroad affected Visalia, although such operations have been significantly reduced or ceased. When it operates, branchline operations generally occur 1 - 2 times per day 5 - 6 days per week. Train movements generally occur during the nighttime hours. Train speeds are generally 14 - 45 mph depending upon the track and operating restrictions. Measurements of individual train passbys near Visalia and Tulare indicated that maximum noise levels range from 83 dBA without the horn to 92 dBA with the horn at 100 feet. SEL's at the same distance ranged from 91.0 to 96.4 dB. It is estimated that maximum levels from the horn may occasionally be 5 - 10 dBA higher than measured depending upon individual noise exposure, as defined by dB L_{dn} , does not result from A.T. & S.F. branchline operations, maximum noise levels generated by individual train events could be

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expected to result in significant short-term impacts, especially for residents located near grade crossings where the horn is used. Operations have been discontinued in the community and tracks have been removed north of Highway 198.

Source: Chief Dispatcher, A.T. & S.F. Railroad, Fresno, California.

SPTCo. Railroad

Branchline operations on the SPTCo. Railroad in Tulare County affect the Visalia uses within the County. Branchline operations presently occur three times per week. Their movements may occur at any time of the day or night. Speeds are restricted to a maximum of 40 mph. Measurements conducted on SPTCo. branchline operations in the Visalia area resulted in maximum levels at 100 feet ranging from 92 - 105 dBA with the use of the horn. SEL's at the same distance ranged from 99.8 to 106.7 dB. Due to relatively infrequent operations on SPTCo. branchlines in Tulare County, cumulative noise exposure as defined by dB L_{dn} is not significant. However, maximum noise levels in the vicinity of grade crossings would be expected to result in significant short term impacts.

Source: Trainmaster's Office, SPTCo., Fresno, California

3.5 Visalia Municipal Airport

Visalia Municipal Airport was evaluated to determine where existing or potential future noise related land use conflicts may occur. The evaluations included interviews with airport management or fixed base operators (FBO's), a field survey of airport facilities, operations and surrounding land uses, and, in some cases, noise monitoring to document noise levels from individual aircraft operations. Noise exposure contours in terms of CNEL were prepared for the airport in instances where the number and type of operations would be expected to result in a 60 dB CNEL contour extending beyond the airport property. Noise contour maps for the airport was prepared based upon annual average operations, which is the customary way of describing airport/aircraft noise exposure around an airport which has fairly constant operations throughout the year.

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The Integrated Noise Model (INM) Version 3.8 was used to prepare the CNEL contours. The INM was developed by the Federal Aviation Administration, and is the preferred method for quantifying airport/aircraft noise impacts due to its availability and sophistication. Version 3.8 is the most recent version of the INM available, and incorporates the latest algorithm for calculating sideline noise exposure and an updated data base of aircraft performance parameters and noise levels.

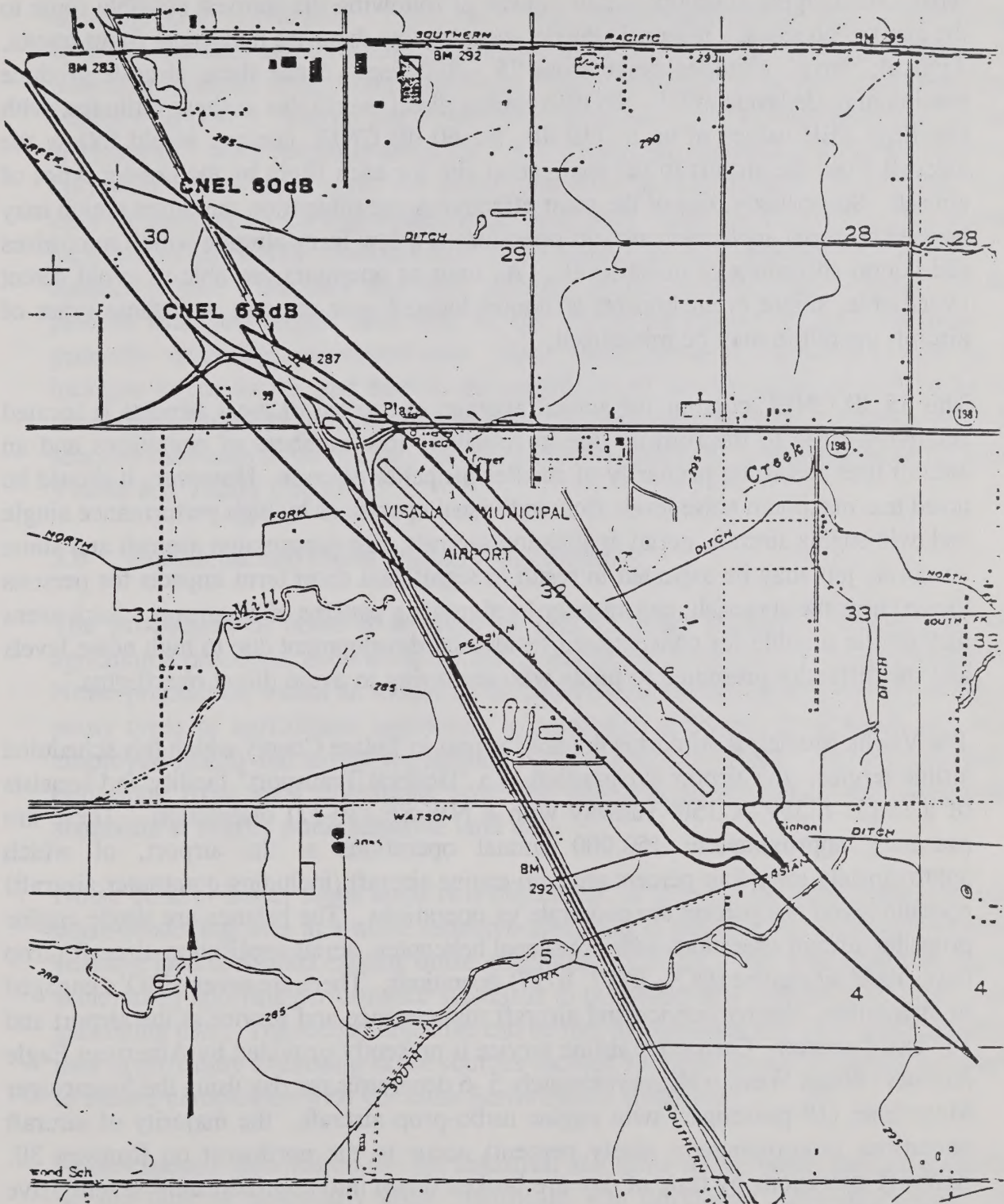
The INM calculates aircraft noise exposure by mathematically combining aircraft noise levels and airport operational factors at a series of points within a Cartesian coordinate system which defines the location of airport runways and aircraft flight tracks. All VFR and IFR flight tracks, which are reportedly used with any regularity, were considered in the noise modeling process. User inputs to the INM include the following:

1. Runway configuration
2. Aircraft flight track definition
3. Aircraft stage length (where applicable)
4. Aircraft approach profiles
5. Aircraft traffic volume and fleet mix

The INM data base contains aircraft performance and noise level data which are representative of most of the commercial and general aviation aircraft fleet and some of the military aircraft fleet. The smaller general aviation aircraft types are grouped by the INM data base into a composite single engine propeller class (COMSEP) and a composite twin engine propeller class (COMTEP). Heavier twin engine turbo-prop aircraft, such as the Swearinger Metroliner, Beech King Air and Embraer Bandeirante are generally included in the medium twin engine turbo-prop class (MTETP). Corporate jet aircraft are subdivided into a number of classes ranging from the light quiet turbo-fan (GALQTF-Citation II) to the medium turbo-fan (GAMTF-Sabreliner 75) and light turbo-jet (GALTJ-Lear 25) classes. Most airports can be modeled using the (GALQTF) and composite general aviation jet (COMJET) classes.

Aerial application aircraft are not addressed in the INM data base. Consultation with aerial application aircraft operators, field observations, and noise measurements indicated that it was not practical, nor representative of perceived noise impacts, to prepare CNEL contours which include contributions from aerial application aircraft for

Figure C-3
Visalia Municipal Airport



Scale: 1 Inch = 2000 feet

C-17

BBA

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airports with frequent operations by such aircraft. The main reason for this is that typical aerial application operations consist of following the shortest possible route to the application site at a minimal altitude, meaning that there are no typical flight tracks. Typical "ferry" altitudes range from 75 - 300 feet. Since these aircraft produce maximum noise levels of 90 - 105 dBA during direct overflights at these altitudes, with resulting SEL values of up to 110 dB, the 60 dB CNEL contour would follow the aircraft from the airport to the application site for each flight by the noisier types of aircraft. Surprisingly, one of the most effective noise mitigation measures which may be used by aerial application aircraft operators is a low ferry altitude which minimizes the lateral spreading of noise levels. As long as operators are able to avoid direct overflights, single event impacts at homes located near airports with these types of aircraft operators may be minimized.

The 65 dB CNEL contour for annual average operations at most airports is located relatively close to the runway due to relatively low numbers of operations and an aircraft fleet consisting primarily of smaller propeller aircraft. However, it should be noted that maximum noise levels from individual operations by high performance single and twin engine aircraft, aerial application aircraft, fire suppression aircraft and some corporate jets may be expected to result in significant short term impacts for persons located near the approach, departure or local training patterns of an airport. Such areas may not be suitable for concentrated residential development due to high noise levels and the difficulty presented to pilots who are trying to avoid direct overflights.

The Visalia Municipal Airport is the only airport in Tulare County which has scheduled airline service. the airport is classified as a "General Transport" facility and consists of a single 6,559' x 150' runway with a NW-SE (30-12) orientation. There are presently approximately 150,000 annual operations at the airport, of which approximately forty-four percent are twin-engine aircraft (including commuter aircraft) operations and one percent are corporate jet operations. The balance are single engine propeller aircraft operations with occasional helicopter, aerial application aircraft (crop duster) and jet charter (DC9, B737, B727) operations. There are seven FBO's engaged in instruction, charter service and aircraft maintenance and service at the airport and 167 based aircraft. Commuter airline service is presently provided by American Eagle Airlines (Wings West) with approximately 5 -6 departures per day using the Swearinger Metroliner (19 passenger) twin engine turbo-prop aircraft. the majority of aircraft operations (approximately ninety percent) occur to the northwest on Runway 30. Aircraft operations by time of day are broken down into approximately seventy-five percent during the day (7:00 a.m. - 7:00 p.m.), approximately fifteen percent during

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the evening (7:00 p.m. - 10:00 p.m.) and approximately ten percent during the nighttime hours (10:00 p.m. - 7:00 a.m.). The Airport Master Plan is presently being updated. The only noise contours which have been previously prepared for the airport were done in terms of the Composite Noise Rating (CNR) scale as part of the previous Master Plan (1973). The 60 and 65 dB CNEL contours for existing operations shown in Figure C-3 were prepared using the FAA's Integrated Noise Model (INM-Version 3.8) with inputs based upon the above described aircraft activity information with aircraft assigned to the flight paths most frequently flown by pilots using the airport facility. When CNEL contours for future conditions are completed as part of the updated Master Plan, they should be included as part of this Noise Element. At the present time, off-airport land uses in the Visalia Municipal Airport environs are generally compatible with airport uses. Since operations at the airport are expected to increase in the future, and there is the possibility of more frequent use by larger air carrier and corporate jet aircraft, it is important that proposed developments of noise sensitive land uses in the vicinity of the airport be carefully considered by the City of Visalia and Tulare County.

3.6 Industrial and Other Major Noise Sources

The production of noise is an inherent part of many industrial, commercial and agricultural processes, even when the best available noise control technology is applied. Noise production within an industrial or commercial facility or in close proximity to many types of agricultural equipment is controlled indirectly by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise emissions from such operations have the potential to exceed locally acceptable standards at nearby noise sensitive land uses.

Noise control issues focus upon two objectives: to prevent the introduction of new noise producing uses in a noise sensitive area, and to prevent encroachment of noise sensitive land uses upon existing noise generating facilities. The first objective can be achieved by applying performance standards to proposed new industrial or other noise generating uses. The second objective can be met by requiring that new noise sensitive uses in proximity to existing noise sources include receiver based mitigation measures to ensure compliance with the same performance standards.

Noise exposure information for the industrial and other major noise sources identified by the City as potentially noise significant was developed from operational data

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obtained from source operators, and from noise level measurements conducted at reference locations around the noise sources. Consistent with the dB L_{dn} methodology, a 10 dB penalty was added to noise levels occurring at night (10:00 p.m. - 7:00 a.m.) where nighttime operations occur. In discussing future operations with source operators it was readily apparent that too many variables exist to allow meaningful projections of future activity or noise levels.

Following are discussions of industrial and other major noise sources which were identified through questionnaires completed by the City and Tulare County. The discussions are intended to provide generalized information concerning the relative noise impacts of each source, and to identify specific noise sources which should be considered in the review of development proposals where potential noise conflicts could result. The following discussions do not represent a comprehensive accounting of all noise sources in the County. It is probable that unidentified industries or other major noise sources exist in the county which generate significant noise levels and could result in noise related land use conflicts. Although these estimates were prepared in 1987 during the initial data collection phase, they are still considered valid worst-case circumstances since most of the facilities have improved their operations.

Generalized 65 dB L_{dn} contours have been prepared for industrial or other major noise sources when such contours are located off the property occupied by the source. These contours are included in Appendix B. It is intended that the generalized contours contained within Appendix B be used as a screening device by Visalia to determine when potential noise related land use conflicts may occur and when site specific studies may be required to properly evaluate noise at a given noise sensitive receiver location.

3.6.1 Manufacturing Plants

Taylor Welding Works

Located at 4146 W. Mineral King Avenue in Visalia, Taylor Welding Works performs welding on trucks and farm equipment. Current operating hours are 8:00 a.m. to 6:00 p.m. The business is enclosed in a sheet metal building. According to the owner, the main noise sources are banging of equipment, movement of trucks and other equipment into and from the business and the air compressor. According to the owner, the business had a "noise problem" a few years ago when it was manufacturing modular homes next to nearby residences. Noise level measurements on January 6, 1987 at the

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western property line of the business resulted in levels ranging from 54-55 dBA. The only audible noise source from the business at this time was the air compressor. Based on this measurement and the operating hours reported by the owner, it is not expected that the 65 dB L_{dn} contours would extend beyond the property boundary. Residential uses are located north of the business. Commercial uses and S.R. 198 border the business on the other sides.

Source: Mr. Clyde Taylor, Owner

Gang Nails Truss Company

This business manufactures trusses for the building trade and is located at the corner of Goshen Avenue and Shirk Road in Visalia. The plant typically operates from 8:00 a.m. to 10:00 p.m. The major noise producing equipment at the plant are nail machines and component cutter saws. Noise levels measured from the nail machine on October 29, 1986 ranged from 65-70 dBA at fifty feet. Noise levels from the saw at 100 feet ranged from 69-71 dBA. Since the saw and nail machine operate intermittently, the 65 dBA L_{dn} noise contour would be expected to be confined to within the company property. Industrial land uses surround the plant.

Source: Mr. Tim Rouca, Manager, Gang Nails Truss Company

3.6.2 Food Processing Plants

Early California Foods

Early California Foods, Inc. has food processing and olive curing plants located at 315 E. Tulare Avenue and at Santa Fe and K Road in Visalia. The plants operate 24-hours a day for 8-9 months out of the year.

Noise level measurements were made on October 29, 1986 at the East Tulare Avenue plant on the east and west sides of the plant. At about 140 feet east of the plant at the nearest residential property line boundary, the noise level ranged from 69-70 dBA. The noise source was escaping steam from a retort system that is used to cook canned food products. On the west side of the plant at a distance of about 120 feet, which represents the closest residential property line, the noise level ranged from 59-60 dBA.

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The source was escaping steam from a steam cleaning device and conveyor. To the east of the plant the generalized 50 dB L_{dn} noise contour based upon measured levels and reported hours of operation is located at approximately 925 feet from the plant. To the west, the generalized 50 dB L_{dn} contour would be located at about 250 feet from the plant. The food processing plant is surrounded by existing residential uses.

At the olive curing plant located at the corner of Santa Fe Avenue and K Road, noise measurements were conducted at a residential location about 1500 feet southwest of the plant on October 15 and 20, 1986, during the evening and the morning hours. Noise levels from machinery ranged from 54-59 dBA with an L_{eq} of about 57 dBA. Based upon these levels and a 24-hour per day operation, the generalized 65 dB L_{dn} noise contour is located about 2200 feet from the center of the plant. This distance is representative of an unobstructed noise exposure in a southwesterly direction. Levels in other directions may be greater or less depending upon specific noise sources and local shielding from buildings and other factors. The City of Visalia should carefully consider potential noise impacts from this significant noise source when reviewing proposals which could result in additional incompatible land uses in the area.

Source: Mr. Horace M. Wells, Production Manager, Early California Foods, Inc.

Knudsen/Kraft Dairy Plant

The Knudsen/Kraft Dairy Plant, located at 715 N. Divisadero Avenue in Visalia, processes fresh milk into several dairy products. The major noise producing equipment at the plant are boilers, exhaust fans, and the power plant evaporator. About 12-24 trucks per day bring products into the plant. Currently, the plant is operating at about 2/3 capacity having operating hours from about 4:00 a.m. to 11:00 p.m., five days a week. When full capacity is attained in about 1 year, the plant will operate 24-hours a day, seven days a week. Noise level measurements were made at representative locations around the perimeter of the plant on January 6, 1987. East of the plant near 716 N. Divisadero, noise levels ranged from 58-60 dBA. West of the plant near a new triplex located on Leslie Street about 100 feet from Goshen Avenue, the measured noise level was 62-63 dBA from plant operations. Noise level measurements conducted by the Tulare County health Department Division of Environmental Health on July 26

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and 27, 1984 at 708 N. Divisadero ranged from 59-61 dBA. At 813 Leslie Street noise levels measured by the Health Department ranged from 54-56 dBA. Based upon the more current noise measurements and the operational information provided by Knudsen/Kraft, the location of the current 65 dB L_{dn} contour was calculated as shown in Appendix B of the Policy Document. The City of Visalia should carefully consider new proposals for noise sensitive land uses near this noise significant facility.

Sources: Mr. Frank Miranda, Chief Engineer, Kraft, Inc., and Tulare County Health Department, Division of Environmental Health.

Real Fresh

Real Fresh, Inc. prepares sterilized food products. The plant is located at 1211 E. Noble Avenue in Visalia. The plant operates Monday through Friday for 24-hours a day. The main noise sources in the plant are boilers and the conveyor system. Noise level measurements at a distance of about 100 feet east of the plant on October 31, 1985 resulted in levels of about 62-63 dBA. At the closest residential interface to the plant, which is about 300 feet to the west, the measured noise level ranged from 52-53 dBA. A generalized 60 dB L_{dn} contour for the operation is shown in Appendix B of the Policy Document.

Source: Mr. Jack McGlashan, Plant Manager, Real Fresh, Inc.

Walnut Dryers/Hullers

On October 15, 1986, noise level data was collected from the Phil Moodey walnut huller at Road 156 and Avenue 280, the Blain Farming nut shelling operation at 1240 E. Caldwell Avenue and the Sequoia Walnut Growers Association Facility at Ben Maddox Road and Goshen Avenue in Visalia. These facilities are believed to be representative of nut drying and hulling operations in the County. The dominant noise source at the Phil Moodey facility was the blower which separates the nuts from the stems, leaves and other materials. This facility operates a few hours a day. Constant noise levels of 77-78 dBA were measured at 100 feet from the blower. Mr. Moodey's huller operates only a few weeks a year during the walnut harvest season. The plant is surrounded by agricultural uses. Roof mounted fans were the dominant noise source at the Blain Farming facility. All other noise producing equipment is enclosed within the building. Constant noise levels of 76-78 dBA were obtained at a location 100 feet

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west of the plant. The plant operates from 8:00 a.m. to midnight during the harvest season and from 8:00 a.m. to 4:00 p.m. during the remainder of the year. Agricultural uses currently surround the plant. The dominant noise sources at the Sequoia Walnut Growers Association plant are a metal conveyor belt and escaping steam. At a distance of 100 feet from the north side of the building, noise levels ranged from 68-69 dBA. The plant operates from 8:00 a.m. to 5:00 p.m. for approximately 6 weeks a year. The plant is currently surrounded by industrial uses.

Visalia Citrus Packers

The Visalia Citrus Packers facility is located at the corner of Race and Tipton Streets in the City of Visalia. The plant generally packs oranges from 8:00 a.m. to 5:00 p.m. May through November. Shipping and receiving generally occurs 24-hours a day. Noise sources associated with the business are forklifts, idling and slow moving trucks, and a refrigeration unit located on the east side of the fruit receiving building. The equipment located within the building is not audible on the outside. At a residential location on Tipton Street opposite the fruit receiving building, noise levels from propane forklifts moving bins of fruit ranged from 62-72 dBA. At a distance of fifty feet from an idling truck, the noise level was a constant 71 dBA. The refrigeration unit was not operating at the time. Based on the reported operating hours and noise levels recorded on January 15, 1987, it is not expected that the 65 dB L_{dn} contour would extend beyond the property boundary. When the refrigeration unit on the east side of the fruit receiving building operates, which is reported to occur about thirty days a year, noise impacts on the east side of the plant are likely to be greater than observed during the survey.

Source: Mr. Bob Bellar, Manager Visalia Citrus Packers

3.6.3 Municipal and Institutional Noise Sources

Tulare County Landfill, Road 80

Noise monitoring of a solid waste landfill operated by the Tulare County Public Works Department near Road 80 and Avenue 328 was conducted on January 6, 1987. About 1100-1200 refuse trucks use the landfill each month. According to the County Public Works Department, this is the largest landfill in the County. The chief noise sources associated with the landfill are trucks and automobiles entering and leaving the landfill,

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and the heavy equipment used to manage and cover the refuse. The dominant noise sources were an Ingersoll-Rand Model 750 Landfill compactor and a Caterpillar D-7 dozer which were operating on the working face of the landfill. The County's Fiat-Allis Model 261B Scraper was not in use at the time. At a distance of about 300 feet from this equipment, noise levels ranged from 63-68 dBA. Noise from refuse trucks and other vehicles in the landfill were not perceptible while this equipment was operating. The posted operating hours of the landfill are 8:00 a.m. to 4:00 p.m., seven days a week, year-round. Assuming that most of the heavy equipment activity takes place near the central part of the landfill, it is not expected that the 65 dB L_{dn} contour would extend beyond its boundaries.

Source: Mr. Roger Hunt, Tulare County Public Works Department

Outdoor Recreational Complexes

Due to the time of year the survey was conducted, no outdoor recreational complexes were found to be operating. However, noise levels from other outdoor recreational complexes which included noise produced by the crown and local traffic have been evaluated for proposed softball diamonds and tennis courts in other areas. Noise levels have been found to vary significantly depending on what activities are taking place during the game. Maximum noise levels have ranged from 65-70 dBA at a distance of about 200 feet from a softball diamond due to yelling and clapping by players and spectators. Due to the sporadic nature of activities at most outdoor recreational complexes, cumulative noise exposure as defined by L_{dn} is typically insignificant. However, the potential for annoyance exists due to the time of day (typically the evening hours) such facilities are used. Steps should be taken to avoid the development of nearby noise sensitive land uses without appropriate receiver based mitigation.

3.6.4 Sand and Gravel Extraction and Processing

Vicon

Vicon is a concrete ready-mix batch plant located near the corner of Bridge and School Streets in Visalia. Major noise sources at the plant are idling and slowly moving trucks in the batch plant yard in addition to conveyors and other stationary equipment. Vibrators in the hoppers and warning buzzers may also be audible at times. Noise

level measurements were conducted off the property on January 16, 1987. At an approximate distance of 100 feet east of the lading area, the noise level from a front loader and plant-related stationary equipment ranged from 75-77 dBA. At a residential location north of the plant on Murray Street plant noise levels ranged from 66-67 dBA. At another residential location on the northwest corner of School and Bridge Streets plant noise levels ranged from 72-73 dBA. The maximum noise level from an air release brake on a truck was 74 dBA at this location. The owner of the batch plant was unwilling to discuss operating hours or other aspects of the business. Based upon experience with numerous other concrete batch plants, it is reasonable to assume that operations generally run from 6:30 - 7:00 a.m. to about 4:00 p.m. Based upon the above described noise level data and operating assumptions, a generalized 65 dB L_{dn} contour has been prepared for the plant as shown in Appendix B.

3.6.5 Agricultural Operations

Diesel Engines on Wells

Diesel or gasoline powered engines on water wells were not observed to be operating in the City during the study period. Based upon file data developed from other studies, a diesel or gasoline pump will produce noise levels of approximately 75-85 dBA at fifty feet if properly muffled. Unmuffled engines can be significantly louder.

Cumulative 65 dB L_{dn} contour would be approximately 475 feet if the pump operated 24-hours per day. For this reason, such stationary diesel or gasoline powered engines may be a significant source of noise if there are nearby noise sensitive land uses.

Aerial Application Aircraft (Crop Dusters)

Aerial application aircraft are frequently used to spray crops or to spread seed or fertilizers. There are many types of fixed or rotary wing aircraft used for aerial application including aircraft with reciprocating, radial and turbine engines and a two or three bladed propeller. Horsepower ratings generally range from 300 to 1200. Most of the noise impacts generated by aerial application aircraft occur as the result of propeller noise and the low altitude that the aircraft are typically flown. Noise level measurements in Tulare County and elsewhere have shown that the noisiest designs are the medium to high horsepower engines with two-bladed propeller which is significantly quieter due to lower tip speed. Measurements conducted east of Pixley

on October 17, 1986 of a Piper Brave (300 hp/3-bladed propeller) indicated that noise levels from this aircraft while applying cotton defoliant ranged from 85-88 dBA at about 600 feet to 97-100 dBA at fifty feet. Measurements on January 16, 1987 near Alta Airport of a Grumman Ag Cat (600 hp/2-bladed propeller) indicated a maximum noise level of approximately 103 dBA at 100-150 feet overhead. Measurements on January 16, 1987 at the Tulare Municipal Airport indicated that maximum noise levels from an 800 hp Turbine Thrust with a 3-bladed propeller range from 90-95 dBA at approximately 100 feet overhead. As noted in the sections addressing individual airports in this document, single event maximum noise levels for aerial application aircraft can be very significant in areas near airports where these aircraft are frequently operated.

Miscellaneous Farming Operations

Farming operations are common throughout nearly all areas of Tulare County with the exception of some mountainous areas and heavily developed areas within the larger communities. Some of the more common noise sources associated with farming operations within Tulare County include tractors, harvesting equipment, and spray equipment. In order to document noise levels generated by such equipment, noise levels were measured at various locations throughout the County. Examples of measured levels include a cotton picker operating at approximately 500 feet away which produced a noise level of 58 dBA. A larger diesel powered wheel tractor pulling a 20-foot disk generated levels of 72-85 dBA at approximately 150 feet. An International 574 diesel powered wheel tractor (smaller than above) pulling a furrower appliance generated levels of 69-79 dBA at approximately fifty feet. Also measured were a Randall weed sprayer with a National one cylinder diesel engine which produced 74-75 dBA at 500 feet, an FMC Bean 267 engine-driven speed sprayer (345C.i.V8) which produced 92-97 dBA at fifty feet depending upon orientation, and an Aerofan 391 speed sprayer which generated 74-76 dBA at 100-300 feet. The above described levels do not include all types of farm equipment, but do not present a range of levels which may be expected. A good general rule-of-thumb is that a diesel engine will produce noise levels of 75-85 dBA at approximately fifty feet. Although farming operations occasionally generate significant noise levels, such levels generally do not last more than a few hours at a given location unless a stationary piece of equipment such as a pump master (or engine) is involved. For this reason, significant cumulative noise exposure as defined by L_{dn} would not generally be expected to result from typical farming operations within Tulare County.

Sources: Various locations and individuals throughout Tulare County.

3.6.6 Special Interest Noise Sources

Fast Food Loudspeakers

Noise levels from several fast food loudspeakers were measured on October 14, 1986. An attempt was made to position the sound level meter microphone directly in front of the speakers. Unavoidably, the noise level data included idling automobile engines. Table C-3 provides a range of the noise levels measured during the survey. Complaints have been received regarding this noise source, especially from residents adjacent to Mooney Boulevard.

Table C-3
Fast Food Loudspeaker Noise Data

Location	*Noise Level
McDonalds, Mooney Boulevard	60-62 dBA
Wendy's Mooney Boulevard	72-77 dBA

*Measured at 25 feet from loudspeaker
Source: Brown-Buntin Associates, Inc.

Wood Cutting

Noise generated by wood cutting activities is primarily caused by chainsaws. Noise may also be generated by wood splitting machines which are hydraulic rams powered by a small gasoline engine similar to what is typically found on a lawn mower. Noise levels generated by typical wood cutting activities were evaluated by measuring noise levels from a chainsaw which was being used to cut sections of wood approximately ten inches in diameter. The chainsaw was an Echo 650 with a 24-inch bar. According to the operator, this is typical of the larger saws used to cut firewood. At twenty-five feet, the saw produced noise levels ranging from 85 to 92 dBA depending upon orientation of the saw and load on the engine. At fifty feet, the saw produced noise

levels of 75 to 84 dBA depending on the same factors. It should be noted that the frequency content of the noise generated by most chainsaws is quite annoying to most persons due to the sensitivity of the ear to the range of sound which is produced by such saws.

Source: J. B. Farms, Orange Cove
Kennels

The Humane Society animal shelter located at Frontage Road 99 and Avenue 280 was selected as a site representative of a kennel. Noise level measurements around the shelter were conducted on October 14, 1986. Since the shelter is enclosed, some measurements were taken directly in front of opened doors to simulate an unenclosed kennel. At a distance of fifty feet from the enclosure, noise levels from barking dogs ranged from 55-68 dBA with doors closed, and 65-79 dBA in front of open doors. As defined by L_{eq} , the noise level at fifty feet from the enclosed building was 63.8 dBA and 71.4 dBA in front of the open doors.

Source: Tulare County Humane Society

4.0 COMMUNITY NOISE SURVEY

As required by the Government Code and ONC Guidelines, a community noise survey was conducted to document noise exposure in areas of the County containing noise sensitive land uses. The following noise sensitive land uses have been identified with the City.

1. All residential uses
2. Schools
3. Long-term care medical facilities, such as hospitals, nursing homes, etc.

Noise monitoring sites were selected to be representative of typical conditions in the City. A combination of short-term and continuous noise monitoring was used to document existing noise levels at these locations during the month of November, 1986. Noise levels were sampled for approximately fifteen minutes during each of three periods of the day and night so that reliable estimates of L_{dn} could be prepared. The data collected during the short-term sampling program included the L_{eq} , maximum noise level, minimum noise level and a description of noise sources which were audible at the monitoring sites. Continuous noise monitoring was conducted at the community

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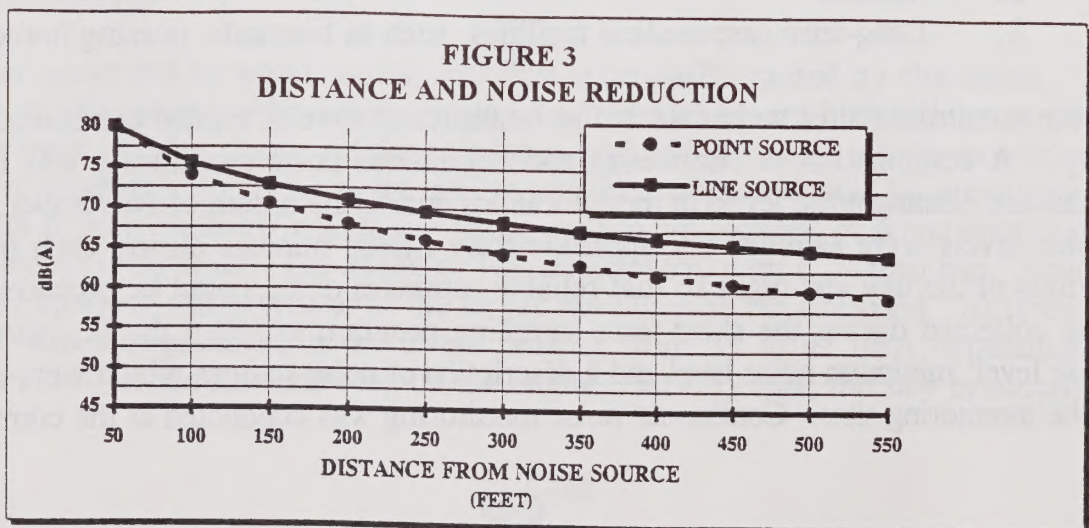
noise survey sites to document fluctuation in noise levels over a typical 24-hour period within the different types of noise environments of the City. Noise level data collected during continuous monitoring included the L_{eq} , maximum noise level, and the statistical distribution of noise levels for each hour of the sample period.

The community noise survey results indicate that typical noise levels in noise sensitive areas of the City ranged from 45 - 55 dB L_{dn} . As would be expected, the quietest areas are those which are removed from major transportation related noise sources and local industrial or other stationary noise sources. It is anticipated that noise levels in recreational areas would be somewhat higher during the summer season when such areas receive greater use. The noisier locations monitored during the survey were in areas located near state highways, major city industries, or railroads. Maximum noise levels observed during the survey were generally caused by local automobile traffic or heavy trucks. Other sources of maximum noise levels included occasional aircraft overflights, railroad operations, barking dogs, and nearby industrial/commercial equipment or machinery. Background noise levels in the absence of the above described sources were caused by distant traffic, wind in the trees, running water, birds, and distant industrial or other stationary noise sources.

5.0 STANDARD NOISE REDUCTION METHODS

Setbacks:

Setbacks provide moderate attenuation of noise. The noise contours estimated in this element assume a conservative level of attenuation. Additional setbacks may have the effects illustrated by the following figure.



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It is noteworthy that while setbacks have a positive relationship to the increased noise reduction, sound barriers walls have an inverse one. For example, an increase of twenty-five feet in setbacks will reduce noise levels by approximately 4.5 dBA. However, with the increased setbacks, the effectiveness of a sound wall will decrease by 2 - 3 dBA, resulting in a net effective noise reduction of 2.5 dBA.

Walls and Barriers:

Walls and barriers provide an effective means to mitigate noise over short distances. The level of noise reduction achieved is directly proportional to the 'effective height' (line of site from highest operable window) of the barrier and the amount of the surface area of the barrier that is enclosed. The effectiveness of a wall will actually decline as the distance from the wall to the noise receiver increases. However, over the range of typical residential setbacks (15 feet to 50 feet) the attenuation value of a wall is relatively constant for a given height as follows:

Table C-4
Noise Reduction
Wall Height

Wall Height (feet)	Noise Attenuation (dBA)	
	Percent of Wall Open	
	5%	10%
5	5	3
6	7	4
7	10	8
8	12	10
9	14	12
10	15	13

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These data assume that the barrier does not have openings which constitute greater than ten percent of the average surface area. If a greater open area is designed into the wall, there will be a significant reduction in the noise reduction effectiveness of the wall or barrier. Walls which have an open area comprise more than twenty percent of the wall surface area will provide only limited sound attenuation.

Landscaping:

Although landscaping materials are not as dense in mass as block walls, they can be used to provide supplemental attenuation, or exclusive attenuation in cases where reductions of 5 dBA or less are required. If plantings are in a continuous 'belt', with lower, dense shrubs providing under-story coverage for larger trees, this form of noise attenuation can be effective. Reliance solely on trees or on low growing shrubs will have little attenuation effect.

Special Building Materials or Systems:

Modern wood siding or stucco walls provide approximately 20 dBA of attenuation. In selected cases, special building materials or systems may be necessary to further reduce the interior noise level of a noise-sensitive land use when the exterior noise level cannot be reduced to 65 dBA or less. Such systems may also be desired when the installation of a block wall or solid barrier would not be consistent with good site design and planning.

Table C-5
Additional Noise Reduction
Alternative Building System

	Added Noise Reduction
Stucco/Frame Wall	7 dBA
Brick Veneer Wall	17 dBA
Increased Stud Spacing	3 dBA
Weatherproofing and Insulation*	15 dBA
Solid Core Exterior Door	9 dBA

* When unit is not already insulated and weatherproofed.

Site and Building Design:

Site and building design are two effective methods to reduce noise impacts. Site design should always be considered as part of an effective noise impact reduction program. The following principles should be used when reviewing development projects:

- a. Noise sensitive land uses should not front on to the primary noise source. Where this is not possible, the narrow portion of the building should face the primary noise source, and the interior layout should locate the most sensitive areas away from the noise source.
- b. Site design should provide for location of buildings with noise sensitive land uses furthest away from the primary noise source. This may be achieved by placing garages, storage facilities, carports or other such areas nearest the noise source.
- c. Site design should permit noise to pass around or through a development. This can be achieved by placing the narrow or convex portion of the structure toward the primary noise source.
- d. Commercial and industrial structures should be designed so that any noise

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generated from the interior of the building is focused away from noise sensitive land uses.

- e. Two story residential construction should be avoided, where possible, immediately adjacent to arterials or collectors unless an adequate combination of noise attenuation procedures are used.
- f. When possible, residential cul de sacs should be perpendicular to adjacent arterials or collectors.
- g. Loading and unloading activities for commercial uses should be conducted in an enclosed loading dock, preferably with a positive seal between the loading dock and trucks.

Except in exceptional cases, modified building construction techniques will normally be the least preferred method of mitigating noise impacts. This is because the technique does not address impacts to outdoor recreation areas and is the most difficult to implement from a regulatory/plan check standpoint. However, there may be circumstances where construction techniques should be modified in order to reduce interior noise levels below the 45 dBA standard. Various factors affect noise attenuation of a wall or construction system; however, the following provides an estimate of the incremental noise reduction provided by alternative building components. The values listed are noise reduction in addition to a standard 2" x 4" frame wall with wood siding.

ENVIRONMENTAL CHECKLIST FORM

Title of Proposal: Noise Element Amendment, City of Visalia

Date: April 26, 1995

Agency: City of Visalia
Address: 702 West Acequia
City/State/Zip: Visalia, CA 93291

Agency Contact: Andy Chamberlain Phone: 730-7003

Project Location: City: Visalia County: Tulare

ENVIRONMENTAL IMPACTS:

(CEQA requires that an explanation of all "yes" and "maybe" answers be provided along with this checklist, and recent court rulings mandate similar discussion of all "no impact" answers, including a discussion of ways to mitigate the significant effects identified. You may attach separate sheets with the explanations on them.)

No Yes Maybe

1. EARTH. Will the proposal result in:

- | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|
| a. | Unstable earth conditions or in changes in geologic structures? | ☐ | ☐ | ☒ |
| b. | Disruptions, displacements, compaction or overcovering of the soil? | ☐ | ☐ | ☒ |
| c. | Change in topography or ground surface relief features? | ☐ | ☐ | ☒ |
| d. | The destruction, covering or modification of any unique geologic or physical features? | ☐ | ☐ | ☒ |
| e. | Any increase in wind or water erosion of soils, either on or off the site? | ☐ | ☐ | ☒ |
| f. | Changes in deposition or erosion of beachsands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake? | ☐ | ☐ | ☒ |
| g. | Exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards? | ☐ | ☐ | ☒ |

2. AIR. *Will the proposal result in:*

- | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|
| a. | Substantial air emissions or deterioration of ambient air quality? | ☐ | ☐ | ☒ |
| b. | The creation of objectionable odors? | ☐ | ☐ | ☒ |
| c. | Alteration of air movement, moisture, or temperature, or any change in climate, either locally or regionally? | ☐ | ☐ | ☒ |

3. WATER. *Will the proposal result in:*

- | | | | | |
|----|--|--------------------------|--------------------------|-------------------------------------|
| a. | Changes in currents, or the course or direction of water movements, in either marine or freshwaters? | ☐ | ☐ | ☒ |
| b. | Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? | ☐ | ☐ | ☒ |
| c. | Alterations to the course or flow of flood waters? | ☐ | ☐ | ☒ |
| d. | Changes in the amount of surface water in any water body? | ☐ | ☐ | ☒ |
| e. | Discharge into surface waters, or in any alteration of surface water quality, including, but not limited to, temperature, dissolved oxygen or turbidity? | ☐ | ☐ | ☒ |
| f. | Alteration of the direction or rate of flow of ground water? | ☐ | ☐ | ☒ |
| g. | Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? | ☐ | ☐ | ☒ |
| h. | Substantial reduction in the amount of water otherwise available for public water supplies? | ☐ | ☐ | ☒ |
| i. | Exposure of people or property to water related hazards such as flooding or tidal waves? | ☐ | ☐ | ☒ |

4. PLANT LIFE. *Will the proposal result in:*

- | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|
| a. | Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)? | ☐ | ☐ | ☒ |
| b. | Reduction of the numbers of any unique, rare, or endangered species of plants? | ☐ | ☐ | ☒ |

		Yes	Maybe	No
c.	Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	☐	☐	☒
d.	Reduction in acreage of any agricultural crop?	☐	☐	☒
5. ANIMAL LIFE. <i>Will the proposal result in:</i>				
a.	Change in the diversity of species, or numbers of any species of animals (birds; land animals, including reptiles; fish and shellfish, benthic organisms or insects)?	☐	☐	☒
b.	Reduction of the numbers of any unique, rare, or endangered species or animals?	☐	☐	☒
c.	Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	☐	☐	☒
d.	Deterioration to existing fish or wildlife habitat?	☐	☐	☒
6. NOISE. <i>Will the proposal result in:</i>				
a.	Increases in existing noise levels?	☐	☐	☒
b.	Exposure of people to severe noise levels?	☐	☒	☐
7. LIGHT and GLARE. <i>Will the proposal:</i>				
	Produce new light or glare?	☐	☐	☒
8. LAND USE. <i>Will the proposal result in:</i>				
	Substantial alteration of the present or planned land use of an area?	☐	☐	☒
9. NATURAL RESOURCES. <i>Will the proposal result in:</i>				
	Increase in the rate of use of any natural resources?	☐	☐	☒
10. RISK OF UPSET. <i>Will the proposal result in:</i>				
a.	A risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	☐	☐	☒

		Yes	Maybe	No
b.	Possible interference with an emergency response plan or an emergency evacuation plan?	☐	☐	☒
11. POPULATION. <i>Will the proposal:</i>				
	Alter the location, distribution, density or growth of the human population of an area?	☐	☐	☒
12. HOUSING. <i>Will the proposal:</i>				
	Affect existing housing, or create a demand for additional housing?	☐	☐	☒
13. TRANSPORTATION/CIRCULATION. <i>Will the proposal result in:</i>				
a.	Generation of substantial additional vehicular movements?	☐	☐	☒
b.	Effects on existing parking facilities, or demand for new parking?	☐	☐	☒
c.	Substantial impact upon existing transportation systems?	☐	☐	☒
d.	Alterations to present patterns of circulation or movement of people and/or goods?	☐	☐	☒
e.	Alterations to waterborne, rail or air traffic?	☐	☐	☒
f.	Increase in traffic hazards to motor vehicles, bicycles, or pedestrians?	☐	☐	☒
14. PUBLIC SERVICES. <i>Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:</i>				
a.	Fire protection?	☐	☐	☒
b.	Police protection?	☐	☐	☒
c.	Schools?	☐	☐	☒
d.	Parks or other recreational facilities?	☐	☐	☒
e.	Maintenance of public facilities, including roads?	☐	☐	☒
f.	Other governmental services?	☐	☐	☒

	Yes	Maybe	No
15. ENERGY. <i>Will the proposal result in:</i>			
a. Use of substantial amounts of fuel or energy?	☐	☐	☒
b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?	☐	☐	☒
16. UTILITIES and SERVICE SYSTEMS. <i>Will the proposal result in a need for new systems, or substantial alterations to the following utilities?</i>			
a. Power or natural gas?	☐	☐	☒
b. Communications systems?	☐	☐	☒
c. Water?	☐	☐	☒
d. Sewer or septic tanks?	☐	☐	☒
e. Storm water drainage?	☐	☐	☒
f. Solid waste and disposal?	☐	☐	☒
17. HUMAN HEALTH. <i>Will the proposal result in:</i>			
a. Creation of any health hazard or potential health hazard (excluding mental health)?	☐	☐	☒
b. Exposure of people to potential health hazards?	☐	☐	☒
18. AESTHETICS. <i>Will the proposal result in:</i>			
a. The obstruction of any scenic vista or view open to the public?	☐	☐	☒
b. The creation of an aesthetically offensive site open to public view?	☐	☐	☒
19. RECREATION. <i>Will the proposal result in:</i>			
Impact upon the quality or quantity of existing recreational opportunities?	☐	☐	☒
20. CULTURAL RESOURCES. <i>Will the proposal:</i>			
a. Result in the alteration of or the destruction of a prehistoric or historic archaeological site?	☐	☐	☒

		Yes	Maybe	No
b.	Result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?	☐	☐	☒
c.	Have the potential to cause a physical change which would affect unique ethnic cultural values?	☐	☐	☒
d.	Restrict existing religious or sacred uses within the potential impact area?	☐	☐	☒

21. MANDATORY FINDINGS OF SIGNIFICANCE.

a.	Potential to degrade: Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒
b.	Short-term: Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively, brief, definitive period of time. Long-term impacts will endure well into the future.)	☐	☐	☒
c.	Cumulative: Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect on the total of those impacts on the environment is significant.)	☐	☐	☒
d.	Substantial adverse. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒

22. DISCUSSION OF ENVIRONMENTAL EVALUATION.

(This section may be filled out by using narrative, or by using a form, such as the example given in the CEQA Guidelines.)

23. DISCUSSION OF LAND USE IMPACTS.

(An examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls.)

24. DETERMINATION.

(To be completed by the Lead Agency.)

On the basis of this initial evaluation:

- a. I find that the proposed project *could not* have a significant effect on the environment, and

A NEGATIVE DECLARATION will be prepared.....□

- b. I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the *mitigation* measures described on an attached sheet have been added to the project.

A NEGATIVE DECLARATION will be prepared.....■

- c. I find the proposed project *may* have a significant effect on the environment, and

An ENVIRONMENTAL IMPACT REPORT is required.....□

(Signature)

(Print Name)

(For

(Date)

INITIAL STUDY AND NEGATIVE DECLARATION

VISALIA GENERAL PLAN NOISE ELEMENT

Introduction and Summary

This Initial Study and Negative Declaration provide an analysis of the likely environmental consequences of adoption of the proposed amendment to the City of Visalia General Plan Noise Element in compliance with the California Environmental Quality Act. The amendment is being prepared to reflect the updated development and growth assumptions contained in the 1991 Land Use Element Update and the 1995 Circulation Element. The Initial Study contains a checklist of likely environmental impacts, a discussion of the proposed project, recommendations on any required mitigation measures to reduce projected impacts to a relative level of insignificance, and consistency with existing land use regulations and policies.

The Noise Element identifies various areas of the community that are or are projected to be impacted by excessive levels of noise within the City's Urban Development Boundary (see Attachment A). The Noise Element identifies performance standards and outlines various mitigation measures to reduce the noise impacts to a relative level of insignificance. Since the Noise Element cannot anticipate all localized conditions and potential mitigation strategies, it also provides for preparation of specialized noise studies and mitigation strategies where the standard noise mitigation measures are not feasible or are insufficient to reduce projected noise impacts below adopted standards. Since the projected noise impacts can be mitigated through the application of the Implementation Program Policies, or through the subsequent mitigation with special noise studies and specialized noise mitigation programs, ***there will not be significant environmental effects because the mitigation measures contained in the Noise Element will reduce any potential impacts to acceptable levels. Consequently, Negative Declaration will be prepared for the project.***

This proposed negative declaration will be subject to a 30-day review period as prescribed by CEQA Guidelines. The City of Visalia, as Lead Agency, intends to adopt the Negative Declaration unless additional evidence is submitted which identifies impacts which cannot be mitigated as described herein. A copy of the draft Noise Element is available from the City of Visalia Planning Division at 707 West Acequia, Visalia, California. Telephone calls may be directed to Andy Chamberlain, Senior Planner at (209) 730-3003, to Stephen Peck, AICP, QUAD Consultants, at (209) 733-0440.

Proposed Project

The proposed project involves the amendment of the Noise Element of the General Plan and establishes goals, objectives, development processing policies, and implementation policies to mitigate potential significant effects on the environment. The Noise Element has been prepared subsequent to the comprehensive update of the City of Visalia's General Plan Land Use Element in 1991. Amendment of the Noise Element is necessitated by the following:

1. Expansion of the Urban Development Boundaries resulting from the 1991 Land Use Element.
2. Revised Land Use Element land uses.
3. Revised Circulation Element street system and traffic loading projections.
4. Change in format to match the updated elements.
5. Development of quantitative guidelines for noise impact mitigation.

A draft Noise Element was prepared in 1986 along with a County-wide noise study conducted by the Tulare County Association of Governments (TCAG). A draft Noise Element was prepared by City staff, technical studies were conducted and draft policies were reviewed with the City Planning Commission in mid-1988. However, the Circulation Element, the Land Use Element and the Conservation, Open Space, Recreation and Parks Elements were being amended at the time and amendment of the Noise Element was deferred until such time as these documents were adopted or substantially complete. The Land Use Element has been adopted and the corresponding Circulation Element is now substantially complete and is now being reviewed by the City with an expected adoption in late 1995 or early 1996. The amendment of the Noise Element has been re-initiated in conjunction with these processes.

The proposed Noise Element includes a description of the existing and future noise environment, existing general plan policies relating to noise impacts, goals and policies, and an implementation program. Noise impacted areas were estimated based on the projected 2020 traffic volumes contained in the 1995 Circulation Element. The Noise Element prescribes mitigation procedures for application to potential development projects which may create noise impacts on noise sensitive land uses, and prescribes mitigation measures for noise sensitive land uses which may be potentially located in noise impacted areas. The Element also establishes standards for acceptable interior and exterior noise levels for different kinds of land uses in the community.

This Initial Study and Negative Declaration is intended to cover the adoption of the Noise Element amendment, any necessary zoning changes, changes in development standards, and development reviews through the building permit and Site Plan Review procedures.

Potential Impacts

The primary source of noise resulting from development in the community is vehicular traffic. In addition to this source, which creates noise impacted areas adjacent to City collectors and arterial roadways, the municipal airport and several fixed point noise sources also exist. Noise level contours have prepared for City roadways based on the projected traffic levels in the year 2020. These noise impacted areas are shown on Attachment B and reflect estimated contours for 60 dB(A), 65 dB(A) and 70 dB(A) noise levels. It is important to note that these are "unattenuated" noise contours since they do not reflect the noise attenuate provided by existing structures, walls or other sound barriers. These noise impact areas contain or affect virtually all land uses which are adjacent to or front on to City collectors or arterials.

Projected noise impacts from the Visalia Municipal Airport are shown in Attachment C. These noise contours assume development of airport as described in the Draft Airport Master Plan. Noise impacts from fixed noise generators will create noise levels ranging from 45 dB(A) to 55 dB(A) on noise sensitive land uses according to the Community Noise Survey prepared for the Noise Element.

Based on the Community Noise Survey and the noise projections prepared for the Noise Element, there are potential impacts to noise sensitive land uses which are adjacent to collector or arterial roadways which carry daily traffic volumes in excess of 15,000 ADT. Unmitigated this would mean that most of the residential areas in the community would be adversely and significantly impacted by community noise. Based on the noise contours estimated in the Noise Element noise mitigation measures which reduce the level of noise ranging from 5 to 15 dB(A) will be necessary.

Mitigation Measures

Mitigation measures have been included in the Land Use Element of the General Plan including the following paraphrased policies:

1. Policy 5.1.5--Reduce negative noise-related impacts through the City's adopted Noise Ordinance, noise mitigation packages, setbacks, location of land uses.
2. Policy 4.1.6--Development of site design measures to buffer residential development from non-residential land uses.
3. Policy 4.4.11--Use open space, landscaping and screening to mitigate noise impacts associated with noise generating and noise sensitive land uses.
4. Policy 7.2.1--Protect the airport from intrusion by incompatible land uses according to the Airport Master Plan, the Airport Compatibility Map and the Airport Compatibility Criteria Table.

Site- or project-specific mitigation should be mitigated through the application of a

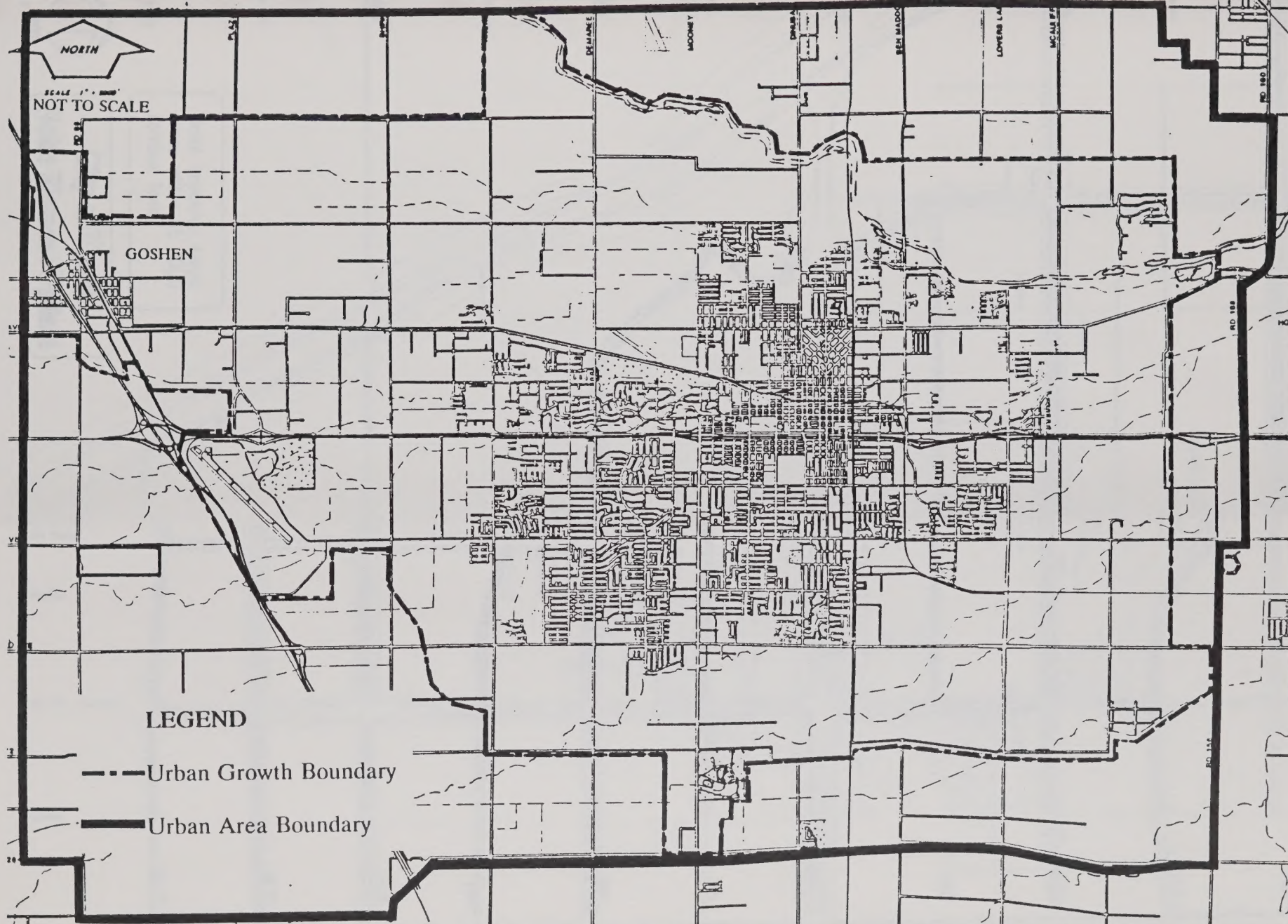
combination of the following Standard Noise Reduction Methods:

1. **Setbacks (without an intervening wall)**--A moderate amount of additional attenuation, 2.5 dB(A), is possible over the range of residential or building setbacks, if setbacks are increased by 50 percent.
2. **Walls and Barriers**.---Walls and other massive barriers create the greatest attenuation over a short distance. For a wall height of seven feet with five percent opening a noise level reduction of 10 dB(A) is possible. Attenuation of 15 dB(A) can be achieved by increasing wall height and eliminating open areas.
3. **Landscaping**.--Landscaping will provide noise reduction of up to 5 dB(A) if planted in a continuous belt with lower, dense shrubs providing understory coverage for larger trees. Sole reliance on either trees or on low growing shrubs will have little attenuation value.
4. **Special Building Materials or Systems**--Special building systems or assemblies are often the most expensive to implement and the most difficult to administer. However, there may be circumstances where such measures are necessary to reduce interior noise levels to acceptable standards. Additional noise reduction can be achieved ranging from 3 dB(A) (24" spacing of wall studs) to 17 dB(A) (use of brick or block exterior wall).

Application of one or more of these techniques will adequately reduce projected noise levels below established levels. Where site conditions or circumstances require, a special noise study may be required to identify site-specific mitigation measures.

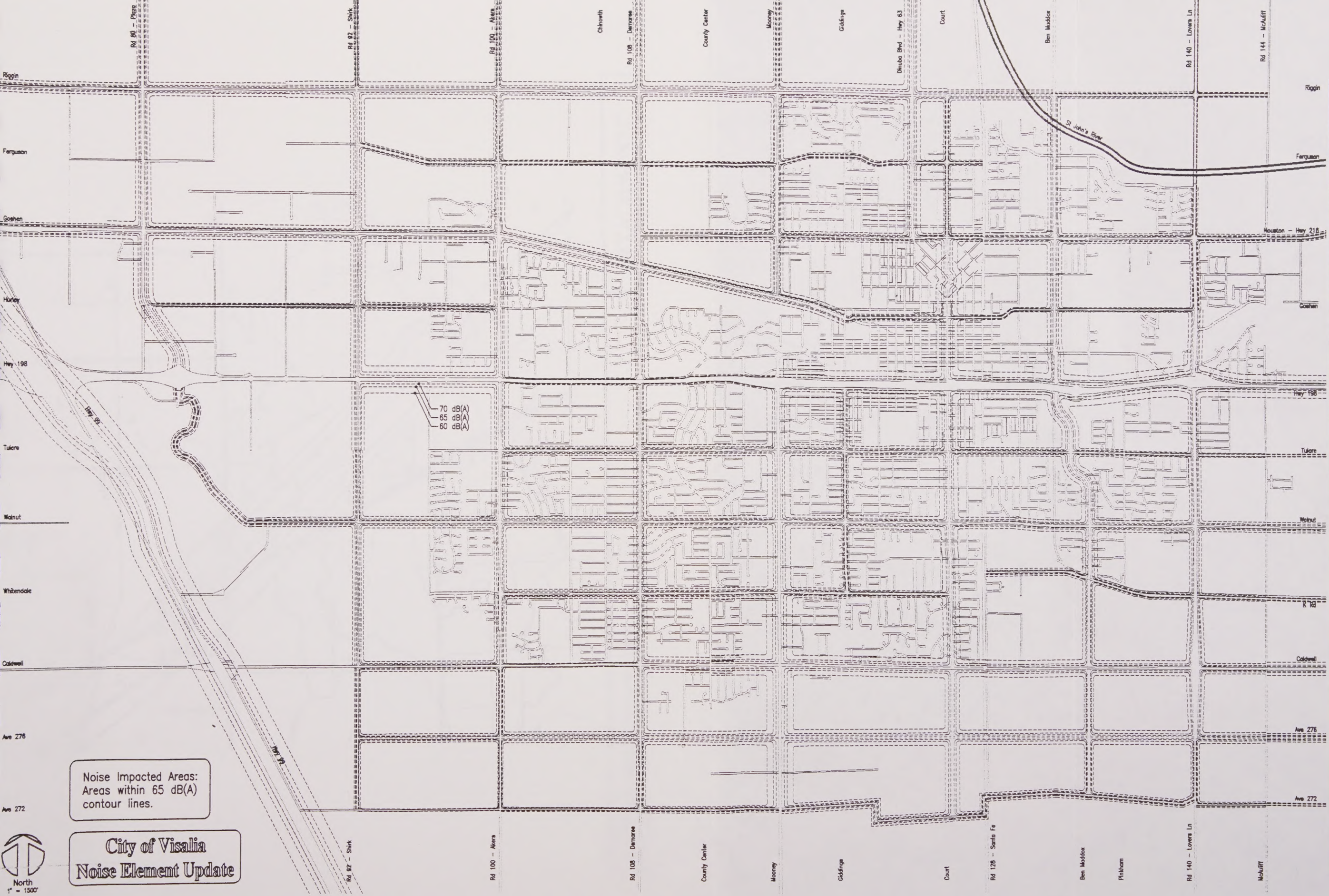
General Plan Consistency

The Noise Element contains a summary of the related Land Use Element, Conservation, Open Space Recreation and Parks Element, and Circulation Element policies which relate to the Noise Element. These policies are included by reference to ensure consistency. Further, the Noise Element noise exposure analysis is based on the current Land Use Element and the traffic projections contained in the 1995 Circulation Element.



LEGEND

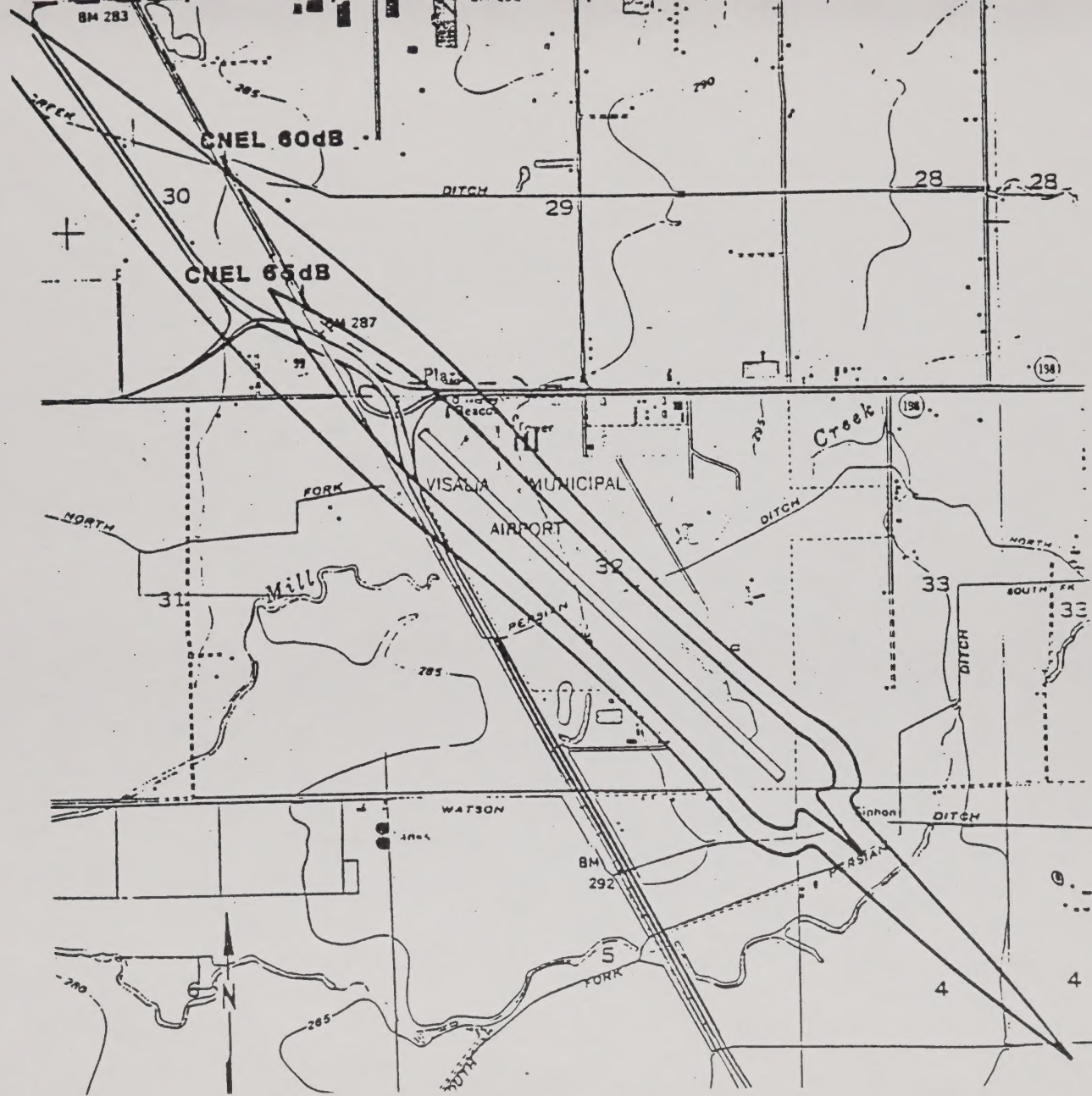
- Urban Growth Boundary
- Urban Area Boundary



Noise Impacted Areas:
Areas within 65 dB(A)
contour lines.

City of Visalia
Noise Element Update





VISALIA NOISE ELEMENT

ATTACHMENT C

U.C. BERKELEY LIBRARIES



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